UK MET OFFICE
GLOBAL DATA MONITORING REPORT

April 2004

Data Assimilation
Meteorological Office
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Air temperature (Degrees C).
:Relative Humidity (%).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AUBK	P	24	0	58	1.7	4.7	5.0
AVOSTEST	P	136	100	100			
CGCB	P	20	100	100			
C6FV4	P	33	0	3	0.9	7.2	7.2
C6TC2	P	32	3	88	1.7	4.4	4.7
DMRX	P	40	0	30	1.1	4.0	4.1
ELVY8	P	36	0	64	1.5	-4.5	4.8
ELZN3	P	30	7	100	1.4	6.4	6.6
H9LW	P	33	0	3	1.3	5.0	5.2
KS003	P	99	0	99	0.5	5.0	5.0
KS005	P	50	0	0	0.4	-4.1	4.1
KS006	P	197	0	0	0.4	4.9	4.9
PHAA	P	24	0	58	2.3	4.2	4.7
PHAL	P	44	2	93	1.5	-6.3	6.5
SXVF	P	23	4	74	1.1	10.3	10.4
TEST	P	100	98	100	5.3	-3.8	6.5
UCUO	P	57	49	91	5.1	-6.8	8.5
UIZE	P	66	0	88	6.8	-6.3	9.3
VRYO2	P	43	0	40	1.2	4.5	4.7
V2AI7	P	23	30	35	2.9	-0.1	2.9
V2JH	P	36	0	53	0.6	-4.0	4.0
V7DV5	P	20	0	70	1.0	4.6	4.7
WDJK	P	25	0	36	1.6	-4.0	4.3
WMCV	P	30	0	50	1.1	-5.2	5.3
ZCBP5	P	21	0	67	2.2	4.9	5.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CF4	SPEED	46	0	39	4.3	5.6	7.1
C6JS	SPEED	21	0	86	2.5	5.2	5.8
ELXT9	SPEED	20	0	25	3.9	5.5	6.7
HP6038	SPEED	230	0	0	3.4	5.3	6.3
OUEV	SPEED	41	2	20	5.2	7.7	9.3
OYVQ2	SPEED	23	0	100	3.8	6.2	7.3
VEP717	SPEED	224	0	1	4.5	6.4	7.8
YJUF7	SPEED	238	0	0	3.4	5.4	6.4
3FUX6	SPEED	35	0	26	6.2	6.4	8.9
9VVU	SPEED	29	7	45	4.4	8.0	9.1

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AVOSTEST	DIRN.	36	11	0	15.4	*****	141.5
C6SI4	DIRN.	25	0	0	42.1	32.0	52.9
DBBX	DIRN.	26	0	0	12.6	-31.5	33.9
FNCI	DIRN.	65	0	0	26.6	30.5	40.4
UICO	DIRN.	29	0	0	38.2	-31.3	49.4
13010	DIRN.	27	0	0	70.8	-31.1	77.3
51006	DIRN.	33	0	0	48.8	33.0	58.9

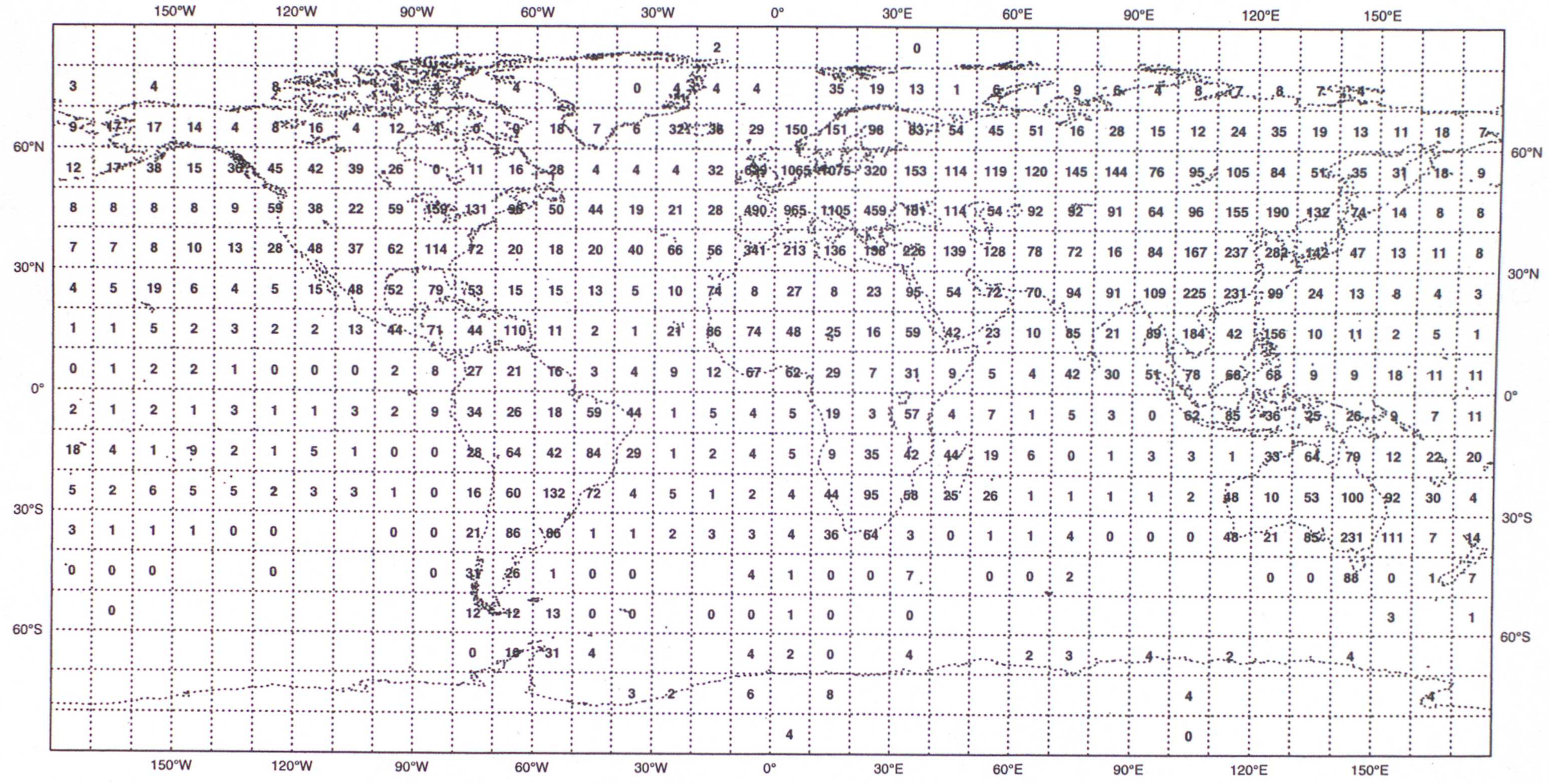
IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDT	T	247	0	100	2.1	-8.2	8.5
DEOT	T	22	0	100	0.9	5.1	5.2
KS034	T	145	26	100	3.5	-1.5	3.9
TEST	T	100	39	100	8.1	-2.5	8.4
UDUK	T	31	0	100	1.8	4.7	5.0
V7BX4	T	62	34	100	1.6	0.3	1.7
V7DN3	T	21	0	100	2.0	4.0	4.5
WCY2920	T	29	0	100	3.9	5.0	6.3
WWU8	T	25	0	100	2.4	6.1	6.6
45142	T	282	0	100	3.3	-4.2	5.4
46081	T	716	1	100	2.6	4.9	5.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS

A8AW2	RH	36	0	100	9.7	18.6	21.0
DICB	RH	72	0	100	20.8	-24.2	32.0
FILL	RH	116	0	100	26.5	-20.3	33.4
FNAT	RH	63	0	100	6.4	22.8	23.7
H9TO	RH	62	0	100	10.3	17.6	20.4
VQKZ5	RH	55	0	100	7.9	16.3	18.1
V7CY4	RH	20	0	100	6.3	15.5	16.8
ZCBH8	RH	43	0	100	6.2	18.5	19.5
ZSWAV1	RH	30	0	100	10.9	-28.2	30.3
3EZF5	RH	85	0	100	9.3	24.6	26.3
3FTL9	RH	28	0	100	6.1	16.1	17.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8DO8	SST	33	0	100	1.7	3.2	3.6
CGDR	SST	174	0	72	1.4	4.3	4.6
CGDS	SST	151	17	105	3.5	3.9	5.2
CG2350	SST	147	3	88	3.7	4.7	6.0
KDBG	SST	25	0	100	0.6	-5.0	5.1
KRPB	SST	40	0	80	0.9	-3.3	3.4
KS003	SST	95	16	100	0.3	-9.3	9.3
LAJV4	SST	44	0	100	2.7	5.1	5.8
LALK4	SST	21	5	24	1.6	-3.4	3.8
LAVU4	SST	28	54	71	3.8	-1.5	4.0
PDZR	SST	24	0	100	1.0	-3.9	4.0
P3FX6	SST	89	0	67	0.7	4.0	4.1
SLCH	SST	35	0	100	1.2	3.6	3.8
S6IW	SST	65	0	71	1.2	3.1	3.3
TEST	SST	22	95	450	0.0	9.1	9.1
TFEA	SST	39	0	54	3.1	3.3	4.5
TSMU	SST	26	0	27	1.0	-3.7	3.8
UCUO	SST	53	0	92	0.8	4.4	4.4
UHVW	SST	26	0	100	0.9	3.3	3.4
VDLC	SST	21	0	52	3.5	3.8	5.2
VOCJ	SST	207	6	100	2.4	4.7	5.3
V2AC6	SST	35	0	100	0.9	3.3	3.4
V2AI7	SST	28	11	96	2.2	6.0	6.4
V2WB	SST	24	0	100	2.1	-3.3	4.0
3FDV6	SST	25	0	100	1.1	4.0	4.1
44014	SST	694	0	74	1.5	-3.9	4.2
45008	SST	171	0	99	0.3	-3.9	3.9
45012	SST	82	0	100	0.1	4.3	4.3
45143	SST	132	0	100	0.2	3.4	3.4
45149	SST	192	0	100	0.2	-3.8	3.8

Figure 1. SHIP/SYNOP mean daily count. APRIL 2004
All hours
Global average number of observations in 24 hours = 21276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60°N
30°N
0°
30°S
60°S
2 0
3 4 8 4 4 4 0 4 4 4 35 19 13 1 6 1 9 6 4 8 7 8 7 4
9 17 17 14 4 8 16 4 12 4 0 9 18 7 6 32 38 29 150 151 98 83 54 45 51 16 28 15 12 24 35 19 13 11 18 7
12 17 38 15 36 45 42 39 26 0 11 16 28 4 4 4 32 639 1065 1075 320 153 114 119 120 145 144 76 95 105 84 51 35 31 18 9
8 8 8 8 9 59 38 22 59 159 131 98 50 44 19 21 28 490 965 1105 459 181 114 54 92 92 91 64 96 155 190 132 74 14 8 8
7 7 8 10 13 28 48 37 62 114 72 20 18 20 40 66 56 341 213 136 198 226 139 128 78 72 16 84 167 237 282 142 47 13 11 8
4 5 19 6 4 5 15 48 52 79 53 15 15 13 5 10 74 8 27 8 23 95 54 72 70 94 91 109 225 231 99 24 13 8 4 3
1 1 5 2 3 2 2 13 44 71 44 110 11 2 1 21 86 74 48 25 16 59 42 23 10 85 21 89 184 42 156 10 11 2 5 1
0 1 2 2 1 0 0 0 2 8 27 21 16 3 4 9 12 67 62 29 7 31 9 5 4 42 30 51 78 66 68 9 9 18 11 11
2 1 2 1 3 1 1 3 2 9 34 26 18 59 44 1 5 4 5 19 3 57 4 7 1 5 3 0 62 85 36 25 26 9 7 11
18 4 1 9 2 1 5 1 0 0 28 64 42 84 29 1 2 4 5 9 35 42 44 19 6 0 1 3 3 1 33 64 79 12 22 20
5 2 6 5 5 2 3 3 1 0 16 60 132 72 4 5 1 2 4 44 95 58 25 26 1 1 1 1 2 48 10 53 100 92 30 4
3 1 1 1 0 0 0 0 21 86 86 1 1 2 3 3 4 36 64 3 0 1 1 4 0 0 0 48 21 85 231 111 7 14
0 0 0 0 0 31 26 1 0 0 4 1 0 0 7 0 0 2 0 0 88 0 1 7
0 12 12 13 0 0 0 0 1 0 0 3 1
0 18 31 4 4 2 0 4 2 3 4 2 4
3 2 6 8 4 4
4 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).
≥ 3 degrees (sea surface temperature).

2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).
≥ 5 degrees (sea surface temperature).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
14925	-22.3	66.2	P	558	14	52	4.0	5.4	6.8
15936	-34.3	-12.7	P	26	100	100			
16578	-51.4	72.5	P	679	6	61	4.1	4.1	5.8
25572	87.7	-133.6	P	231	47	77	8.5	2.3	8.8
44772	55.8	-32.1	P	163	52	67	1.6	-0.2	1.6
56528	-51.1	-118.8	P	366	63	68	1.2	-0.2	1.2

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
22584	27.4	128.6	SST	22	0	68	2.4	-3.2	4.0
31987	-26.2	0.8	SST	77	100	100			
33502	-33.8	-11.4	SST	102	0	100	1.1	4.1	4.3
44509	49.9	-51.1	SST	232	25	100	1.4	7.5	7.6
44510	50.4	-50.3	SST	169	54	100	1.3	6.3	6.5
44511	44.1	-48.6	SST	175	2	65	2.9	-4.6	5.4
46972	18.9	179.5	SST	165	0	100	0.5	4.6	4.7
51743	-9.4	179.6	SST	43	0	100	1.6	7.7	7.9
53593	39.3	144.9	SST	309	0	88	1.5	-4.3	4.5
56528	-51.1	-118.7	SST	354	44	44	0.3	-0.4	0.5

Figure 2. DRIFTER mean daily count. APRIL 2004
All hours
Global average number of observations in 24 hours = 11502

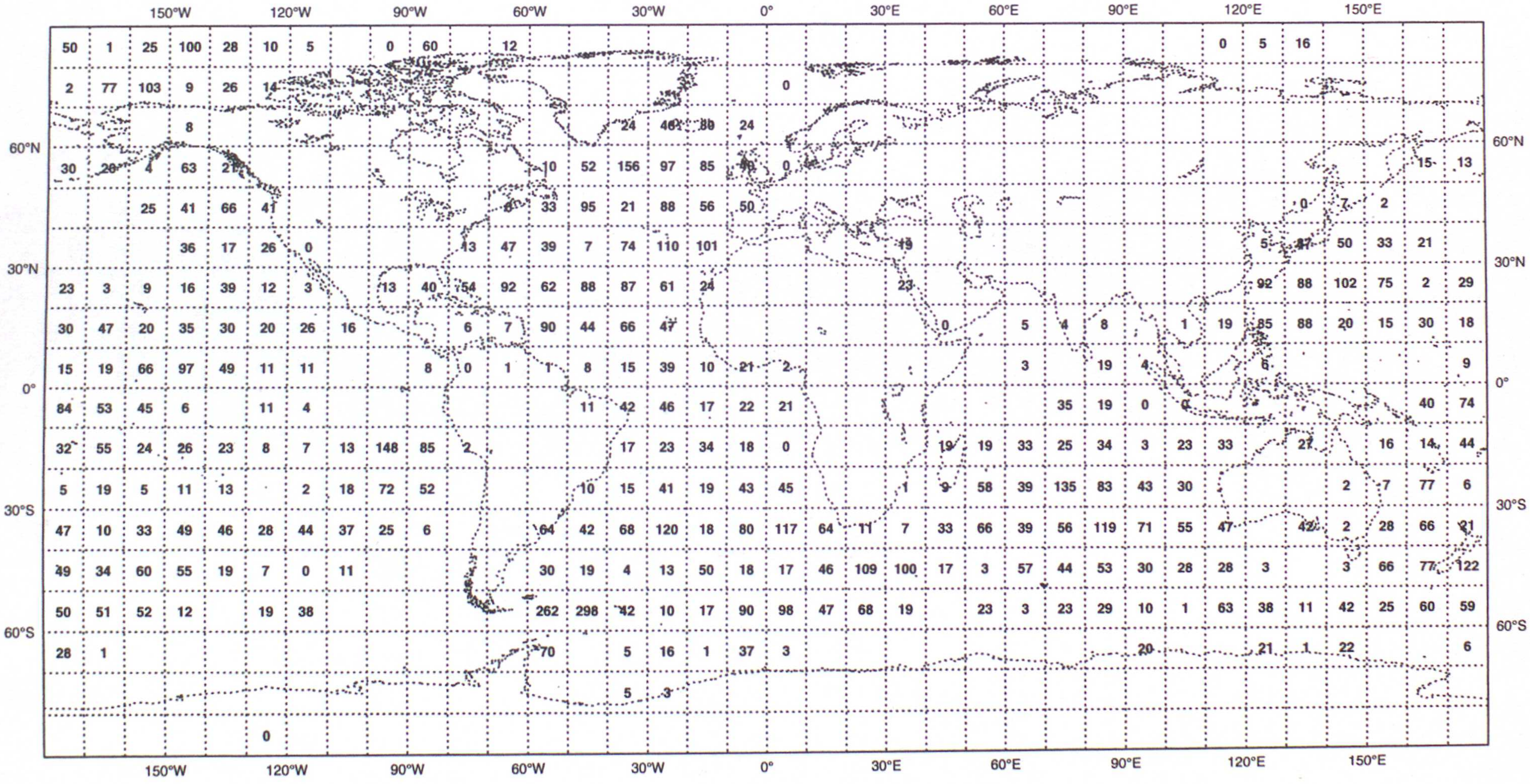

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
50 1 25 100 28 10 5 0 60 12 0 5 16
2 77 103 9 26 14 0
8 24 46 80 24
30 20 4 63 21 10 52 156 97 85 0 15 13
25 41 66 41 33 95 21 88 56 50 0 7 2
36 17 26 0 13 47 39 7 74 110 101 19 5 47 50 33 21
23 3 9 16 39 12 3 13 40 54 92 62 88 87 61 24 23 92 88 102 75 2 29
30 47 20 35 30 20 26 16 6 7 90 44 66 47 0 5 4 8 1 19 85 88 20 15 30 18
15 19 66 97 49 11 11 8 0 1 1 8 15 39 10 21 2 3 19 4 6 9
84 53 45 6 11 4 11 42 46 17 22 21 35 19 0 0 40 74
32 55 24 26 23 8 7 13 148 85 2 17 23 34 18 0 19 19 33 25 34 3 23 33 27 16 14 44
5 19 5 11 13 2 18 72 52 10 15 41 19 43 45 1 9 58 39 135 83 43 30 2 7 77 6
47 10 33 49 46 28 44 37 25 6 64 42 68 120 18 80 117 64 11 7 33 66 39 56 119 71 55 47 42 2 28 66 21
49 34 60 55 19 7 0 11 30 19 4 13 50 18 17 46 109 100 17 3 57 44 53 30 28 28 3 3 66 77 122
50 51 52 12 19 38 262 298 42 10 17 90 98 47 68 19 23 3 23 29 10 1 63 38 11 42 25 60 59
28 1 70 5 16 1 37 3 20 21 1 22 6
5 3
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION APR 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	57	2	4	0	1.0	-9.1	9.2
60728	36.4N	10.7E	1	MS	74	0	0	0	0.8	-8.6	8.6
61816	10.9N	14.3W	69	S	33	16	48	0	2.7	-0.8	2.8
62056	32.8N	21.8E	625	S8	61	2	3	3	1.2	-5.4	5.5
63330	13.5N	39.5E	2070	MS	35	35	100	60			
63333	11.1N	39.7E	1903	MS	33	1	3	3	0.5	5.7	5.7
63334	10.3N	37.7E	2515	MS	33	0	0	0	0.9	11.3	11.3
63450	9.0N	38.8E	2354	MS	27	0	0	0	0.6	5.2	5.2
63478	5.9N	43.6E	295	MS	25	0	0	0	1.3	5.2	5.4
63801	4.9S	29.6E	882	S8	80	1	1	1	0.7	8.2	8.2
63881	8.0S	31.6E	1923	S	49	1	2	0	1.2	12.7	12.8
65355	9.8N	1.1E	342	MS	117	1	1	0	0.8	-11.8	11.8
67229	14.7S	34.3E	1270	S	30	15	50	53	0.7	14.0	14.0
68030	18.5S	25.6E	1071	8	75	1	1	0	3.6	5.6	6.7
68106	23.6S	15.1E	407	MS	59	1	2	0	1.0	-4.7	4.8
68300	26.6S	15.1E	16	MS	83	38	46	0	0.4	-14.3	14.3
68396	26.5S	31.3E	641	S8	57	0	0	2	1.5	4.5	4.7
68575	30.0S	30.0E	1175	S8	119	119	100	0			
68674	31.6S	29.6E	47	MS	22	0	0	5	1.7	6.1	6.3

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	120	1	1	0	1.0	11.9	11.9
35416	49.1N	54.7E	128	S	119	0	0	0	0.7	4.1	4.2
36982	41.9N	78.2E	3635	S7	120	1	1	2	0.9	6.6	6.7
38565	40.6N	65.7E	485	MS	119	118	99	0	0.0	-1.7	1.7
38846	38.4N	70.0E	1437	S8	70	1	1	0	1.2	-5.5	5.6
40435	24.5N	44.4E	991	MS	58	0	0	0	1.0	7.7	7.8
40700	39.6N	47.9E	45	MS	118	0	0	1	1.4	-5.2	5.4
40713	37.4N	46.3E	1475	MS	118	3	3	0	0.8	13.2	13.2
40726	36.8N	45.7E	1384	MS	114	0	0	0	1.0	4.0	4.1
40741	36.5N	61.2E	235	MS	117	1	1	1	2.0	-4.4	4.8
40743	36.2N	57.7E	978	M	117	1	1	1	1.3	4.8	5.0
40757	35.6N	53.4E	1171	MS	120	0	0	6	1.6	4.5	4.8
40780	33.6N	46.4E	1362	MS	113	0	0	0	0.7	5.1	5.1
41254	23.1N	57.6E	1755	S8	68	68	100	0			
47022	40.8N	128.2E	1224	S	110	0	0	2	1.5	4.2	4.5
47678	33.1N	139.8E	79	MS	120	0	0	0	0.8	-9.4	9.4
48924	21.1N	101.5E	644	S	43	2	5	0	1.2	11.1	11.2
48925	20.7N	102.0E	550	S	52	4	8	4	3.2	-9.7	10.2
48938	19.2N	101.7E	326	MS	44	22	50	0	1.1	14.1	14.1
50727	47.2N	119.9E	1028	MS	120	0	0	0	0.6	4.7	4.7
50978	45.3N	131.0E	234	MS	120	0	0	0	0.8	-5.6	5.7
52866	36.6N	101.8E	2262	S	120	0	0	0	1.0	-4.6	4.7
53646	38.2N	109.7E	1058	MS	120	0	0	0	0.5	-11.8	11.8
56462	29.0N	101.5E	2994	S	120	0	0	0	1.3	8.8	8.9
56768	25.0N	101.5E	1773	S	120	0	0	0	0.8	-5.2	5.3
57816	26.6N	106.7E	1074	MS	120	72	60	0	0.4	-14.5	14.5
59663	21.9N	112.0E	22	MS	120	0	0	0	0.6	-7.1	7.1

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	48	4	8	6	2.5	-4.9	5.5
82181	2.0S	54.1W	146	MS	62	0	0	0	0.9	5.4	5.5
82704	7.6S	72.7W	170	MS	68	1	1	1	1.6	-4.7	5.0

83235	12.4S	46.4W	604	MS	77	0	0	1	0.9	6.3	6.4
83332	14.1S	46.4W	826	MS	78	4	5	0	0.6	13.8	13.8
83470	17.9S	50.9W	727	MS	77	0	0	0	0.5	-5.7	5.7
83531	18.6S	46.5W	940	MS	78	0	0	0	0.5	-6.3	6.3
83738	22.5S	44.5W	440	MS	79	6	8	0	0.9	-13.5	13.5
83836	25.5S	50.6W	837	MS	78	0	0	0	0.6	-5.3	5.3
84425	5.9S	76.1W	179	MS	26	0	0	0	0.8	4.5	4.6
84455	6.5S	76.4W	281	MS	80	0	0	0	1.4	7.1	7.2
84472	7.1S	78.5W	2620	S	51	0	0	0	0.7	-5.3	5.3
84474	7.2S	76.7W	350	S	26	0	0	0	0.7	9.4	9.4
84686	13.6S	72.0W	3248	S	110	0	0	0	0.7	-4.1	4.2
84688	13.7S	73.4W	3444	S	45	1	2	0	0.6	-12.2	12.2
84720	14.9S	75.0W	567	MS	51	0	0	0	0.6	4.3	4.3
84782	18.1S	70.3W	468	MS	89	0	0	0	1.4	7.8	7.9
85140	14.3S	67.4W	140	MS	59	0	0	0	1.2	6.8	6.9
85264	18.5S	64.1W	1998	S	59	1	2	58	1.1	5.4	5.5
85312	19.8S	63.9W	992	S	48	0	0	4	1.3	-11.6	11.7
85406	18.3S	70.3W	55	M	115	0	0	0	1.2	4.4	4.6
85432	22.5S	68.9W	2320	S8	80	0	0	0	0.8	4.8	4.9

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	120	0	0	0	1.4	4.2	4.4
71060	52.5N	116.1W	230	MS	120	120	100	0			
71094	66.6N	61.6W	393	MS	119	0	0	0	1.2	-4.4	4.6
71181	47.1N	55.3W	29	MS	120	0	0	0	0.8	-6.1	6.2
71421	51.9N	63.3W	589	MS	79	0	0	0	0.9	5.0	5.1
71506	67.0N	136.2W	720	MS	120	0	0	2	1.8	-4.8	5.1
71619	48.0N	65.3W	46	MS	357	164	46	0	5.7	-3.0	6.4
76055	31.0N	114.9W	440	MS	58	58	100	0			
76225	28.6N	106.1W	1435	MS	88	1	1	2	1.4	-4.5	4.7
76658	19.2N	103.7W	494	MS	28	0	0	0	0.6	5.5	5.5
76762	17.5N	99.5W	1265	MS	58	2	3	0	0.9	5.4	5.5
78588	17.2N	87.5W	-298	M	120	117	98	0	0.3	-0.2	0.4
78655	14.0N	89.6W	725	MS	50	1	2	2	2.0	10.1	10.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94130	14.8S	131.9E	120	MS	120	0	0	0	0.9	5.1	5.2
96505	3.7N	115.7E	-9999	8	26	26	100	0			
97378	10.7S	123.1E	1	MS	46	44	96	0	1.5	-13.3	13.4
98851	6.1N	125.2E	14	S	99	23	23	99	1.6	-13.4	13.5

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	118	0	0	0	0.8	6.6	6.6
06685	47.0N	9.1E	515	MS	115	0	0	21	1.3	5.9	6.0
06780	46.8N	9.8E	2690	S7	115	0	0	0	0.6	4.0	4.0
08912	42.9N	0.8W	1434	MS	225	225	100	0			
08922	42.8N	0.2W	1660	MS	218	218	100	0			
10850	48.8N	10.7E	457	MS	359	0	0	0	0.4	-5.5	5.5
11116	47.5N	10.8E	870	MS	60	0	0	0	0.8	4.5	4.6
13269	44.3N	19.9E	176	MS	114	0	0	0	0.8	7.8	7.8
14554	44.9N	18.4E	136	S	56	1	2	0	0.7	-13.3	13.3
16204	42.9N	11.8E	816	S	69	0	0	0	0.8	4.1	4.2
16344	39.3N	16.4E	1710	S8	116	0	0	0	1.4	4.0	4.2
16450	37.6N	14.3E	940	S8	98	0	0	2	1.0	-4.9	5.0
16538	40.1N	9.3E	1022	S	40	0	0	0	1.0	9.0	9.1
17203	38.9N	40.5E	1177	S8	120	0	0	0	1.0	5.8	5.9
37018	44.1N	39.0E	95	MS	115	0	0	1	1.2	6.3	6.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	88	0	0	0	1.2	-6.3	6.4
89257	75.4S	59.9W	40	S	829	0	0	0	1.3	-5.5	5.7
89263	66.0S	66.1W	20	M	248	2	1	0	1.1	12.4	12.4
89264	71.4S	68.9W	780	S	263	0	0	0	1.1	8.2	8.3
89266	72.2S	60.2W	91	S	250	229	92	0	8.3	-10.1	13.1
89272	75.0S	70.8W	1395	S	255	255	100	0			
89512	70.8S	11.8E	140	MS	119	1	1	0	1.7	-4.1	4.4
89610	65.9S	113.1E	90	S	229	0	0	0	1.3	-8.3	8.4
89614	66.6S	111.2E	500	M	249	249	100	0			
89744	74.0S	43.1E	3353	S	265	0	0	0	0.8	7.0	7.0
89811	66.7S	112.8E	1366	S	261	0	0	0	1.2	-4.1	4.3
89868	79.9S	170.0E	60	S	272	0	0	0	1.2	-4.0	4.2

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3456	0	43	1.4	-0.2	3428	0	42	0	6.2	0.4
AAL	7103	0	39	1.5	0.1	6773	0	39	0	5.9	0.2
AAR	1500	0	6	1.7	-0.5	1483	0	7	0	7.7	0.4
ACA	2332	1	16	1.8	0.1	1988	0	18	0	8.4	0.4
ACI	124	0	10	1.1	0.4	124	0	10	0	5.1	1.1
AEA	920	1	2	1.5	-0.1	554	0	2	0	6.1	0.2
AEL	481	1	10	1.8	-0.1	414	0	9	0	6.9	0.3
AEW	57	2	5	1.2	-0.3	23	4	17	0	5.8	-1.1
AFL	611	0	6	2.1	0.1	360	0	4	0	7.0	0.2
AFR	1593	1	6	1.4	0.1	1252	0	8	0	7.9	0.4
AJM	385	1	2	1.3	-0.3	288	0	1	0	5.7	0.5
AJX	294	0	5	1.5	0.2	297	1	9	0	9.3	-0.4
AMT	2008	0	44	1.2	0.2	1994	0	44	0	6.4	0.1
AMX	328	1	6	2.0	0.2	227	0	100	0	11.8	0.2
ANA	82	0	4	2.1	1.3	82	0	2	0	6.2	0.4
ANZ	5326	0	26	1.3	0.2	5298	0	26	0	6.4	0.6
ARG	71	6	25	1.9	0.1	48	2	31	0	9.6	-0.2
ATN	198	0	100	3.6	-1.1	189	0	35	0	12.6	1.6
AUA	71	0	90	6.9	6.8	58	0	10	0	8.8	2.2
AVA	229	0	5	1.8	0.5	153	0	5	0	7.9	0.4
AVN	150	4	49	1.2	0.1	152	0	47	0	6.5	-1.4
AXF	28	0	25	1.1	0.7	28	0	25	0	6.0	0.5
AZA	530	1	6	1.8	0.1	404	0	5	0	7.8	0.6
BAF	28	0	4	1.7	-0.8	22	0	9	0	6.7	-1.4
BAL	465	0	7	1.4	0.1	430	0	9	0	7.7	0.4
BAW	896	1	12	1.7	-0.3	686	0	12	0	7.2	0.9
BBR	154	3	6	1.6	0.6	94	0	5	0	9.8	0.8
BHP	54	0	0	1.2	-0.7	46	0	0	0	5.6	0.4
BJT	26	0	19	2.4	0.4	23	0	22	0	6.1	0.0
BPA	491	0	6	1.6	-0.2	428	0	7	0	7.3	0.1
BWA	335	1	4	1.6	-0.3	250	0	3	0	7.5	0.6
CAL	34	0	9	1.8	0.1	36	0	14	0	9.1	0.5
CCA	384	2	14	1.8	-0.4	400	0	100	0	11.4	-0.4
CES	396	2	6	1.7	0.0	401	0	8	0	8.6	1.5
CFC	27	0	0	1.3	-0.4	24	0	0	0	4.7	0.5
CFG	839	0	3	1.3	-0.2	698	0	5	0	7.5	-0.1
CKK	192	2	7	1.7	0.4	195	2	8	0	7.8	0.6
CKS	444	0	30	1.8	0.6	382	0	33	0	9.6	0.6
CLX	389	0	3	1.6	-0.5	222	0	3	0	5.9	0.3
COA	217	1	25	1.4	0.1	159	0	23	0	7.8	1.4
CPA	33	0	9	1.5	0.5	36	0	8	0	4.8	1.4
CRL	900	1	3	1.5	0.6	686	0	4	0	8.5	0.4
CSN	123	1	9	1.8	0.2	122	0	12	0	7.7	0.2
CUB	201	1	5	1.9	-0.1	166	1	4	0	6.0	0.2
DAL	3811	0	37	1.4	0.0	3364	0	41	0	6.2	0.1
DCE	44	0	7	1.2	-0.3	39	0	13	0	7.0	0.7
DCS	35	3	9	1.8	-0.1	21	0	10	0	6.0	-0.7
DHL	141	9	100	6.3	-6.1	71	0	100	0	22.0	4.7
DLH	1132	0	13	1.5	0.0	1044	0	14	0	6.3	0.9
ECI	37	3	5	2.1	-0.7	20	0	5	0	6.4	1.3
EDW	142	0	2	1.4	-0.3	104	0	3	0	5.5	0.3
EEZ	145	0	6	1.5	0.3	120	0	5	0	5.5	-0.6
EIA	301	2	100	3.1	0.9	294	0	100	0	17.5	3.9
ELY	178	0	1	1.3	-0.1	129	0	2	0	5.6	-0.3
EVA	151	0	5	1.3	0.0	158	1	8	0	7.7	0.6
FCA	131	0	1	1.2	0.2	92	0	5	0	9.2	0.3
FDX	2088	0	43	1.4	0.3	1934	0	44	0	7.0	0.3
FIN	200	0	2	1.5	0.2	126	0	5	0	7.7	0.5
FJI	767	1	35	2.0	1.0	751	0	34	0	7.0	1.1

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FLC	21	14	29	1.6	0.6	20	0	15	0	8.5	0.9
FOM	728	0	26	1.4	-0.1	727	1	26	0	5.7	0.9
FWI	550	2	3	1.5	-0.3	493	1	4	0	7.0	0.6
GAF	35	0	3	1.5	-0.8	20	0	0	0	5.2	0.0
GCO	139	1	17	1.5	0.2	136	0	16	0	7.4	0.7
GHA	41	0	5	2.4	-0.6	33	0	9	0	17.4	1.4
GRL	77	0	4	1.6	0.3	67	0	1	0	4.7	1.2
GTI	210	1	20	1.8	0.5	205	1	20	0	6.7	0.2
HAL	5000	0	41	1.3	0.2	4955	0	41	0	6.0	0.5
HRH	95	0	52	0.7	0.2	95	0	53	0	8.1	1.4
HXL	251	2	5	1.6	0.9	202	0	3	0	6.6	0.5
IBE	2871	1	5	1.4	0.3	2078	0	6	0	6.8	0.4
ICE	1027	0	2	1.5	0.0	605	0	2	0	6.5	0.7
IWD	183	1	2	1.3	-0.1	138	0	6	0	8.2	-0.4
JAL	2709	0	5	1.7	0.4	2689	0	6	0	8.0	0.3
JAZ	565	0	4	1.6	0.6	566	0	4	0	7.8	-0.4
JBU	52	6	8	1.1	-0.2	54	0	4	0	6.1	-1.0
KAI	69	0	48	1.9	0.5	69	0	46	0	6.0	0.2
KAL	1948	0	8	1.8	0.0	1968	0	9	0	8.7	0.6
KLM	1573	0	3	1.5	-0.1	1034	0	4	0	6.0	0.4
LAN	521	0	5	1.7	-0.2	521	0	5	0	6.1	0.7
LAP	98	8	53	2.6	1.6	94	0	49	0	11.1	1.5
LDI	455	1	2	1.3	0.1	311	0	5	0	7.9	0.0
LNE	97	3	7	1.8	0.2	69	0	3	0	9.2	-0.4
LOT	172	1	5	1.9	-1.1	112	0	6	0	6.9	0.5
LTU	1123	1	5	1.7	-0.2	840	0	3	0	7.0	0.6
LXJ	22	0	45	1.1	0.2	22	0	45	0	6.3	0.3
MAS	351	0	5	1.5	0.0	352	0	5	0	5.7	0.7
MON	43	0	2	1.3	-0.2	33	0	3	0	8.3	0.1
MPD	303	0	4	2.1	0.6	217	0	3	0	6.9	1.0
MPH	583	0	3	1.6	-0.7	443	0	4	0	7.0	0.1
MXA	93	3	17	2.9	0.6	89	1	21	0	17.5	0.6
MYT	337	0	4	1.8	0.4	271	0	5	0	8.1	0.4
NAO	435	1	30	1.4	0.3	422	0	30	0	7.5	0.3
NCA	1127	0	3	1.5	0.3	848	0	5	0	7.1	0.2
NWA	7829	1	12	1.6	0.1	7758	0	13	0	7.7	0.3
NZL	3475	0	8	1.1	-0.1	3474	0	8	0	4.8	0.5
OAE	621	0	37	1.2	-0.3	574	0	100	0	8.7	1.0
PAC	516	1	14	1.5	-0.1	449	0	16	0	8.1	0.4
PAL	1527	1	10	1.4	0.0	1504	0	11	0	8.0	0.3
PAO	285	0	52	1.6	0.6	285	0	52	0	6.9	1.1
PBI	532	0	27	1.6	-0.3	531	0	27	0	5.8	0.5
PLM	161	0	5	1.9	1.0	103	1	74	0	7.6	-0.3
PUA	56	2	54	2.5	0.4	54	0	59	0	16.3	-0.8
QFA	4358	0	49	1.3	0.4	4348	0	49	0	5.9	0.6
QQA	49	0	47	1.7	0.3	49	0	45	0	4.6	0.8
RAM	268	1	5	1.7	0.3	107	0	73	0	10.4	0.2
RCH	225	2	100	3.9	-1.0	172	1	100	0	10.5	1.5
RJA	42	0	10	2.5	-0.4	29	0	0	0	5.1	0.7
RRR	193	1	7	1.7	-0.3	191	1	10	0	7.8	1.0
RZO	339	1	3	1.6	-0.5	172	1	4	0	7.4	0.2
SAA	95	1	3	1.6	-0.2	85	0	0	0	5.6	0.4
SEU	597	1	3	1.6	0.0	517	0	4	0	7.4	0.2
SIA	415	0	4	1.4	0.4	414	0	4	0	4.5	0.5
SOO	29	0	7	1.3	0.9	50	0	6	0	6.8	0.2
SQC	36	0	6	1.2	0.3	36	0	3	0	4.6	0.3
SSV	22	0	0	1.1	0.1	20	0	5	0	8.1	2.7
SVH	40	0	13	2.1	1.8	40	0	13	0	7.4	1.6
TAG	45	0	27	2.1	0.1	30	0	30	0	5.3	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAM	64	6	25	2.0	1.0	64	2	27	0	14.0	-1.7
TAP	535	1	5	1.8	-0.3	205	0	4	0	8.1	0.0
TCX	87	0	6	1.5	0.6	83	0	6	0	8.2	1.1
THA	170	0	4	1.6	0.2	170	0	5	0	4.9	0.3
THT	149	0	28	1.3	0.5	133	0	29	0	8.9	0.7
TPA	33	0	0	0.8	-0.2	27	0	0	0	4.9	1.1
TSC	60	0	3	1.5	-0.5	35	0	3	0	7.4	1.1
UAE	523	0	3	1.2	0.2	526	0	4	0	4.7	0.3
UAL	377178	0	97	1.2	-0.2	376608	0	97	0	5.0	0.4
UPS	2031	0	58	1.4	0.0	2009	0	59	0	7.3	0.6
USA	177	0	1	1.2	0.1	130	0	1	0	6.4	0.7
VHF	23	0	0	1.2	-0.8	24	0	0	0	5.4	-2.0
VIR	225	0	2	1.5	0.2	133	1	3	0	5.5	0.6
VRG	187	3	43	2.5	1.2	183	0	100	0	14.1	1.3
VVR	63	0	35	2.5	0.9	64	0	30	0	7.4	0.1
WOA	513	1	21	1.4	0.1	468	0	23	0	7.8	0.5
XLA	178	0	2	1.4	0.4	137	0	7	0	9.5	0.6
YSS	65	2	5	1.2	0.6	57	0	5	0	7.6	0.9

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	39714	0	9	1.3	0.6	39709	0	9	0	5.2	0.6
EU	191852	0	26	1.2	0.2	191847	0	25	0	4.5	0.5
HK	2801	0	24	1.3	0.0	2801	0	24	0	5.5	0.3
KL	1743	0	1	2.0	1.7	1742	0	1	0	6.4	0.3
LN	71	0	37	2.4	-0.1	73	1	40	0	11.2	2.4
MK	3261	0	8	1.7	1.2	3249	0	8	0	6.9	1.7
SA	2751	0	10	1.3	0.7	2750	0	16	0	5.6	0.5
TN	99	0	31	2.0	0.6	102	0	31	0	6.2	1.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	1305	2	30	2.2	0.3	1126	0	32	0	8.0	0.7
US ACARS	1152854	0	67	1.3	0.3	1152847	0	67	0	5.3	0.5

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	222	1	45	1.3	-0.2	213	0	45	0	4.9	1.3
ACA	52	0	27	1.8	0.0	49	0	31	0	11.0	1.3
AFR	90	0	4	1.2	-0.2	80	0	15	0	10.6	2.4
ANZ	151	0	23	0.9	0.0	152	0	22	0	4.8	-0.2
AXF	20	0	50	1.5	1.2	20	0	50	0	9.9	1.2
AZA	37	0	5	1.4	-0.3	33	0	12	0	8.1	-0.7
BAF	41	5	5	1.4	0.2	25	0	4	0	8.5	0.1
CFC	79	0	5	1.2	0.5	71	0	8	0	9.4	0.1
CFG	27	4	4	0.7	0.0	24	0	4	0	6.8	-0.3
CKS	76	0	32	1.4	0.4	64	0	38	0	9.6	0.1
CRL	45	0	0	1.2	0.4	35	0	6	0	9.0	-1.1
DAL	171	0	31	1.3	-0.3	152	0	36	0	8.7	0.9
DLH	276	0	11	1.5	-0.1	274	0	13	0	7.8	1.2
EIA	52	0	100	1.5	-0.3	51	0	100	0	21.2	5.9
FDX	640	0	25	1.2	0.3	494	0	26	0	6.3	0.6
FJI	26	8	54	1.9	0.3	25	0	56	0	12.0	-0.4
GAF	54	0	6	1.0	0.1	27	0	7	0	8.7	0.0
GCO	53	0	13	0.9	-0.1	55	2	15	0	6.6	0.9
GNY	29	0	14	2.0	0.9	28	0	11	0	4.6	-0.4
HAL	219	0	46	1.1	0.1	219	0	47	0	5.5	0.8
IBE	31	3	6	0.9	-0.1	28	4	11	0	5.9	0.5
ICE	44	0	2	1.3	-0.7	24	0	0	0	5.3	1.2
JAL	152	1	6	1.5	0.5	150	1	7	0	7.4	0.8
JAZ	73	0	4	1.7	0.8	71	0	4	0	6.9	1.7
KAL	40	3	13	1.3	-0.2	39	0	15	0	14.0	1.0
KIW	33	15	27	2.9	-0.5	33	0	18	0	5.4	0.7
KLM	58	0	3	1.9	-0.3	45	0	2	0	9.3	0.7
LAN	27	0	7	2.1	0.8	25	0	12	0	7.7	-0.5
MAS	22	0	9	0.9	-0.4	22	0	9	0	5.7	0.0
MPH	78	0	1	1.7	-0.7	45	0	2	0	6.7	0.9
MYT	28	0	0	2.1	1.1	21	0	5	0	11.5	0.5
NCA	79	0	0	1.4	0.3	60	0	2	0	8.4	0.8
NWA	269	0	9	1.4	0.2	270	0	11	0	7.9	0.0
NZL	15942	0	52	1.1	0.3	15942	0	52	0	4.3	-0.1
OAE	56	0	18	1.0	-0.3	44	0	100	0	13.9	3.8
PAC	52	0	4	1.3	-0.2	47	0	4	0	5.9	0.8
PAL	76	0	29	1.1	-0.5	76	0	29	0	6.9	1.7
QFA	207	1	43	1.6	0.0	205	0	40	0	5.0	0.6
RCH	30	3	100	2.4	2.0	27	0	100	0	9.1	-2.0
RRR	149	13	33	3.1	0.8	143	0	17	0	10.2	0.9
SIA	52	0	6	1.0	0.3	52	0	6	0	3.6	0.0
SVH	971	0	57	1.9	0.6	971	0	57	0	5.9	1.3
UAE	78	0	3	0.9	0.5	80	0	3	0	3.8	0.2
UAL	473447	0	99	1.1	-0.1	472457	0	99	0	4.3	0.2
UPS	206	0	54	0.9	-0.1	205	0	52	0	5.3	0.9
VVP	38	0	53	3.5	2.6	38	0	45	0	8.2	-0.6
WOA	210	1	6	1.3	0.1	166	1	14	0	11.3	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	27239	0	48	1.1	0.4	27392	0	48	0	3.8	0.0
EU	595401	0	68	1.0	0.2	591301	0	68	0	3.8	0.0
HK	2217	0	73	1.3	0.4	2217	0	73	0	4.3	0.3
KL	1056	0	55	1.9	0.7	1056	0	55	0	4.9	0.1
MK	1906	0	54	1.3	0.7	1888	0	54	0	4.6	0.7
SA	3154	0	59	1.6	0.1	3155	0	64	0	4.4	-0.1
US ACARS	1841081	0	78	1.2	0.3	1836199	0	78	0	4.4	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 61981

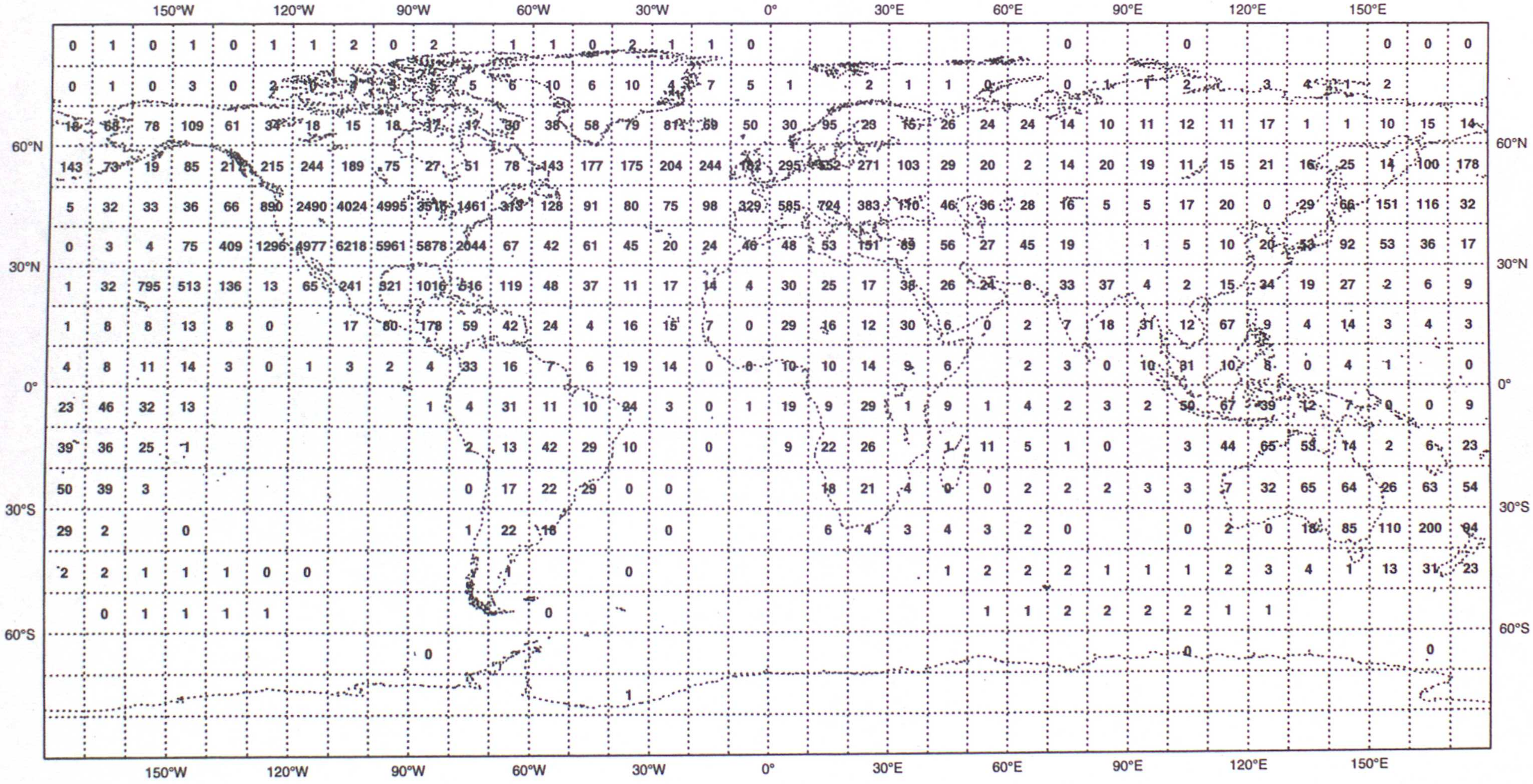

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 98549

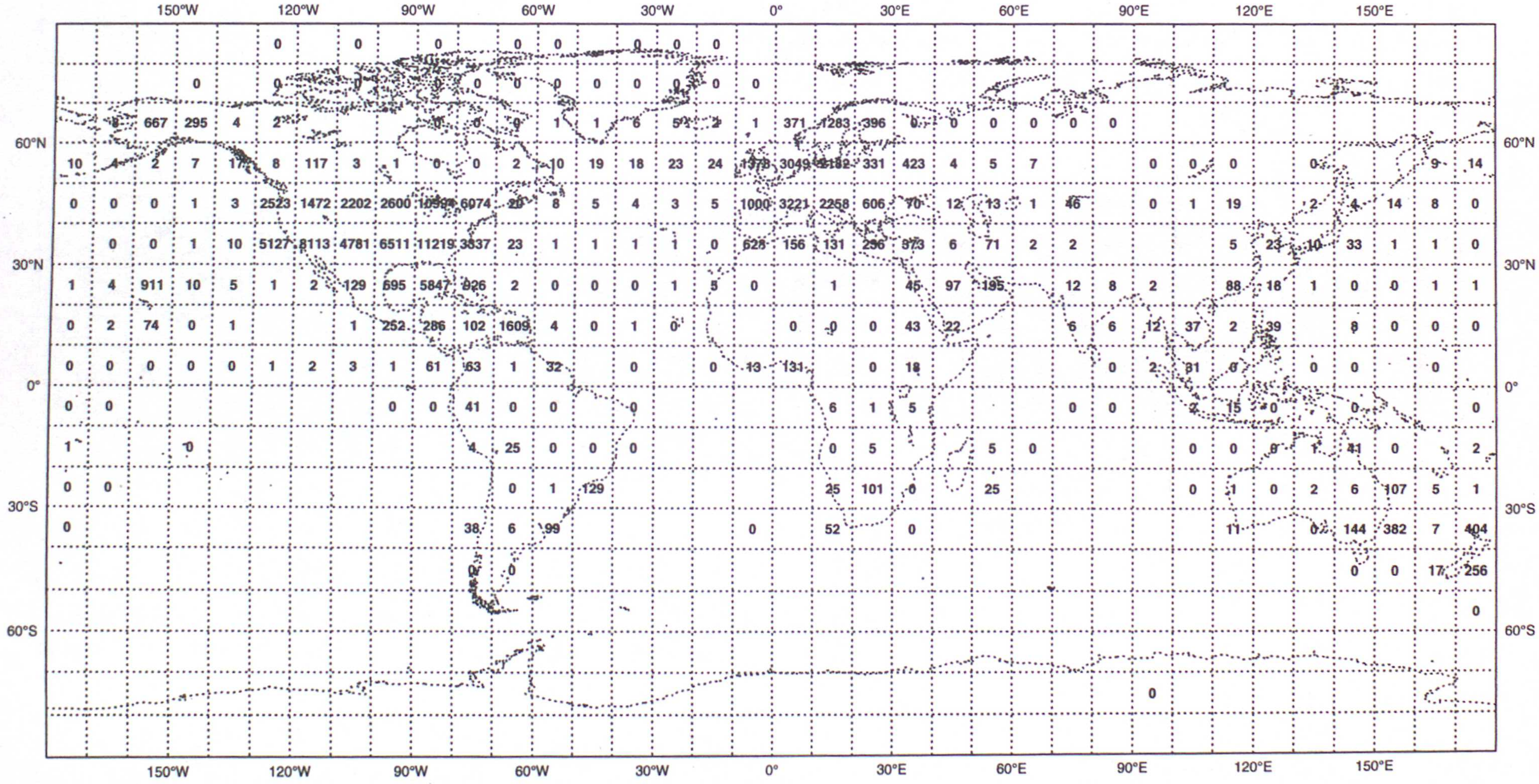

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
8 667 295 4 2 0 0 0 1 1 6 5 2 1 371 1283 396 0 0 0 0 0 0
10 4 2 7 17 8 117 3 1 0 0 2 10 19 18 23 24 1378 3049 6182 331 423 4 5 7 0 0 0 0 9 14
0 0 0 1 3 2523 1472 2202 2600 10994 6074 20 8 5 4 3 5 1000 3221 2258 606 70 12 13 1 46 0 1 19 2 4 14 8 0
0 0 1 10 5127 8113 4781 6511 11219 3837 23 1 1 1 1 0 628 156 131 256 873 6 71 2 2 5 23 10 33 1 1 0
1 4 911 10 5 1 2 129 695 5847 926 2 0 0 0 1 5 0 1 45 97 195 12 8 2 88 18 1 0 0 1 1
0 2 74 0 1 1 252 286 102 1609 4 0 1 0 0 0 0 43 22 6 6 12 37 2 39 8 0 0 0
0 0 0 0 0 1 2 3 1 61 63 1 32 0 0 13 131 0 18 0 2 81 6 0 0 0
0 0 0 0 41 0 0 0 6 1 5 0 0 2 15 0 0 0
1 0 4 25 0 0 0 0 5 5 0 0 0 6 1 41 0 2
0 0 0 1 129 25 101 0 25 0 1 0 2 6 107 5 1
0 38 6 99 0 52 0 11 0 144 382 7 404
0 0 0 0 17 256
0
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

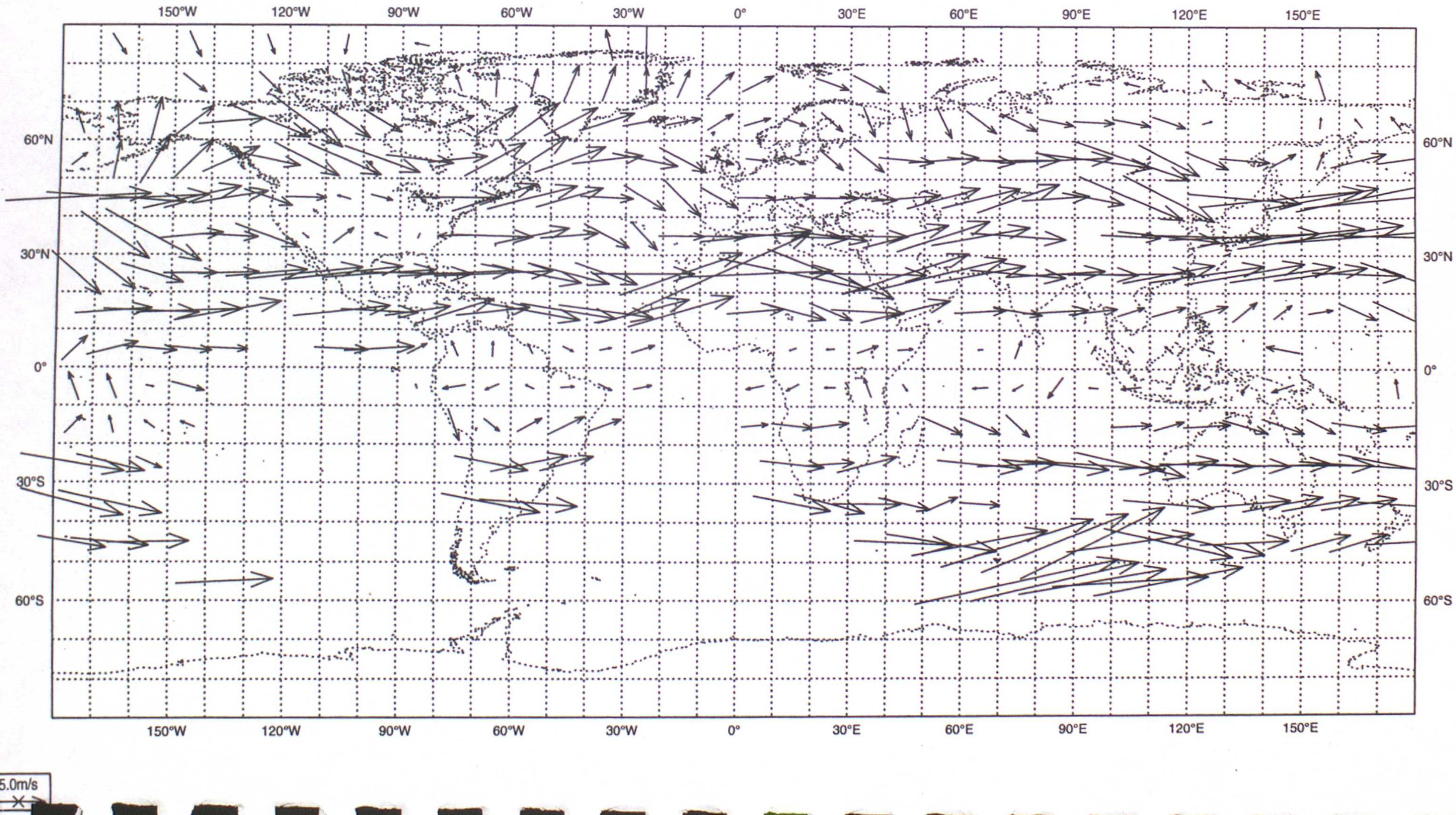

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

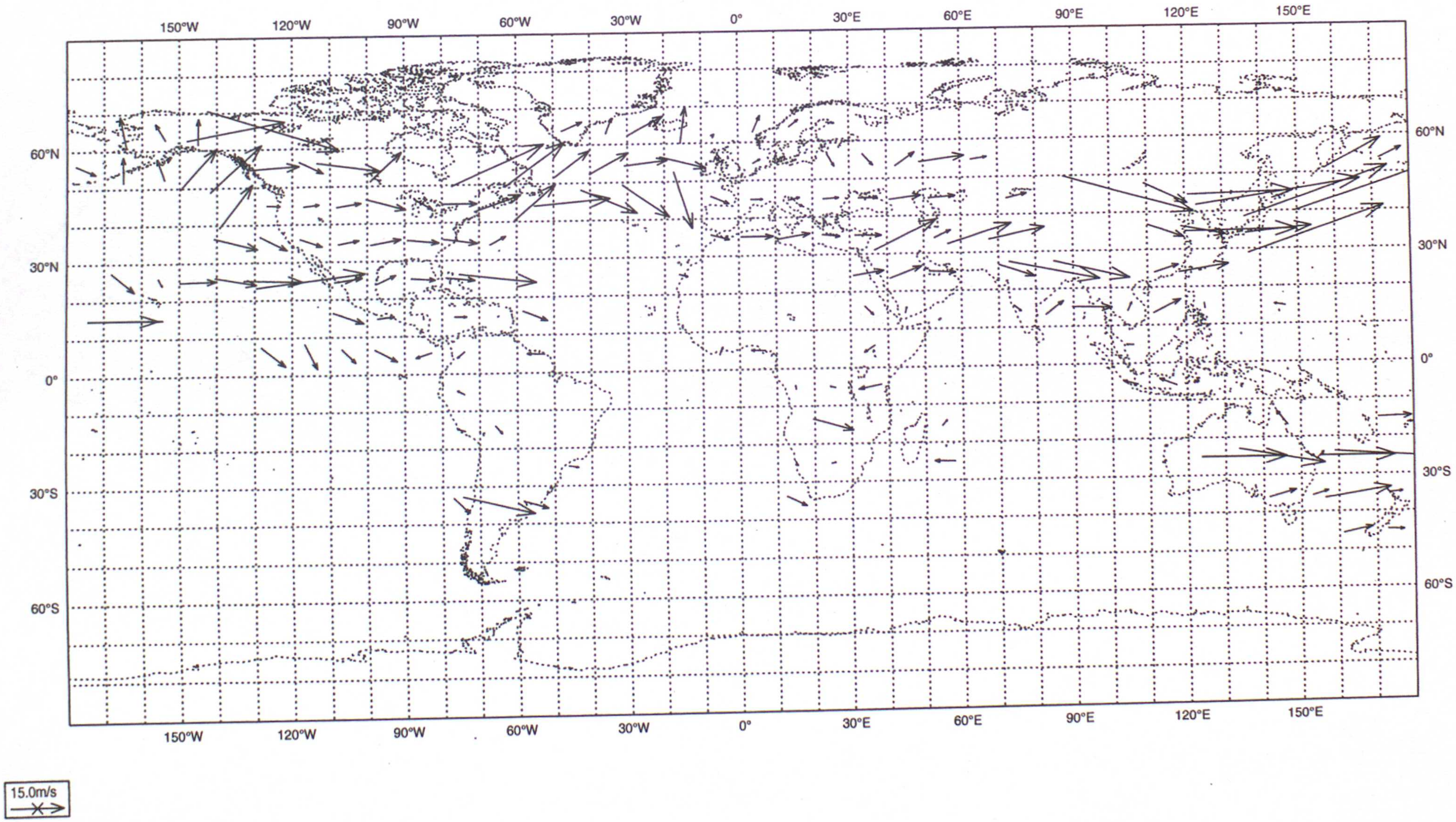

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

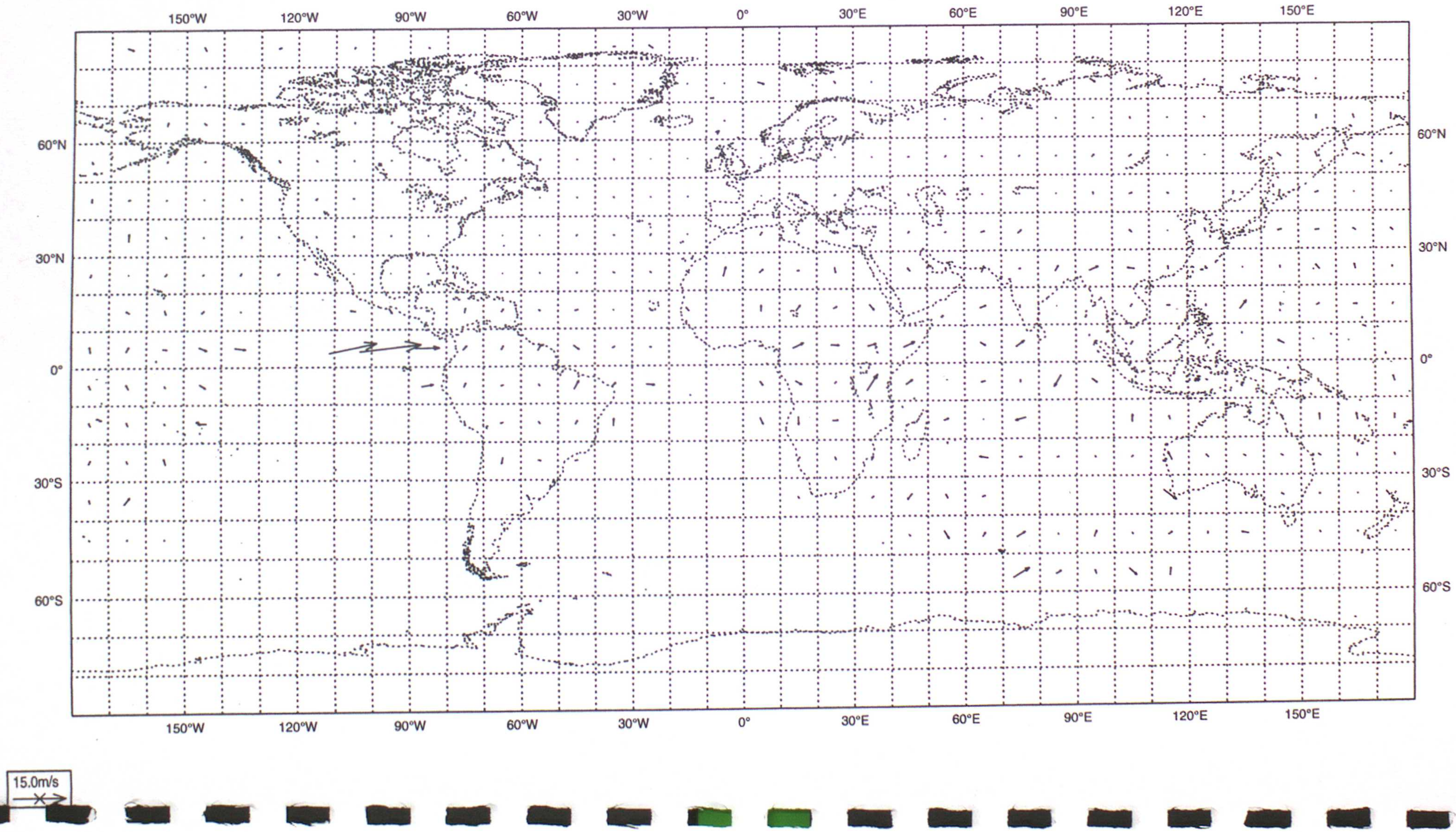

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

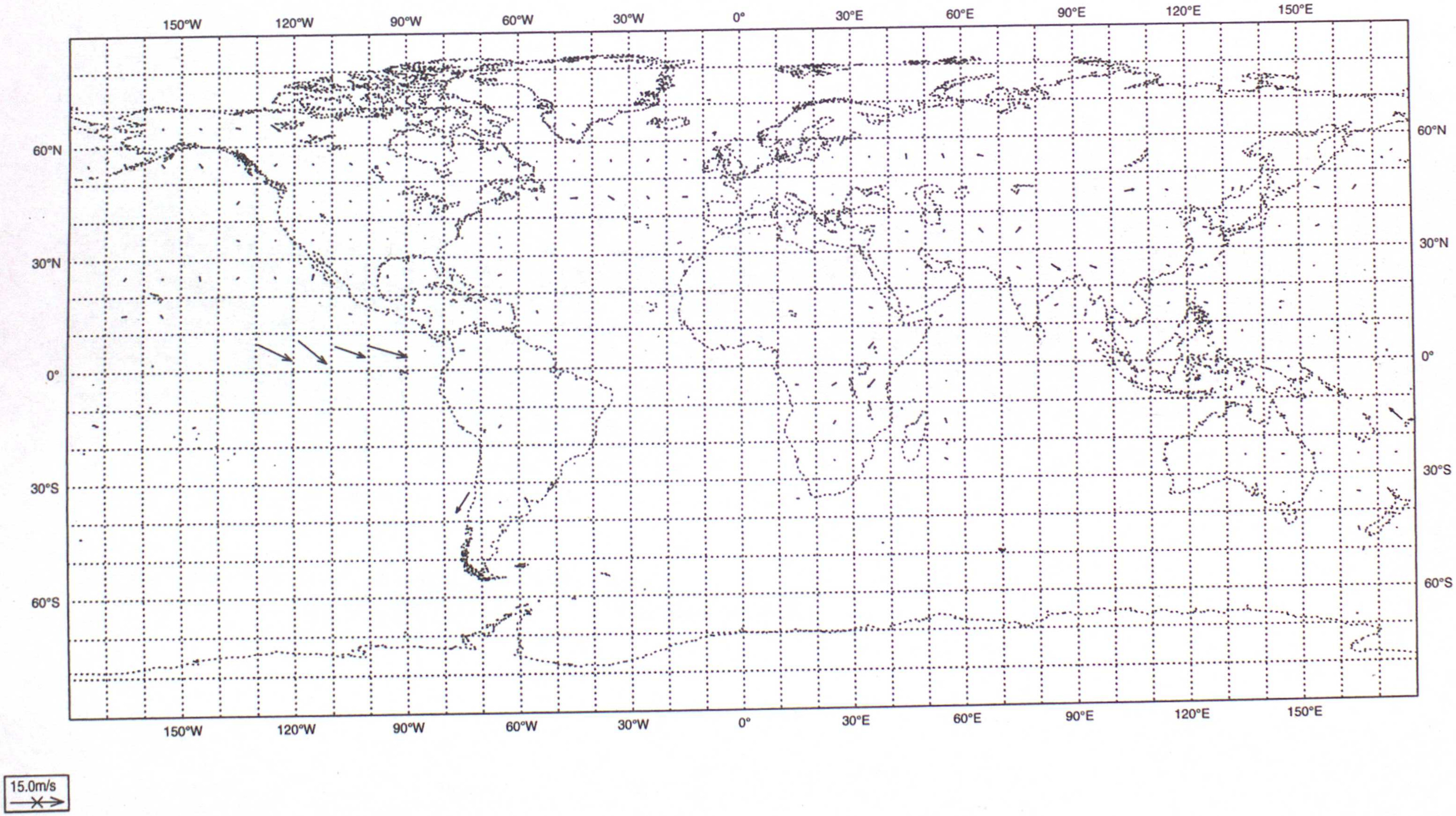

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

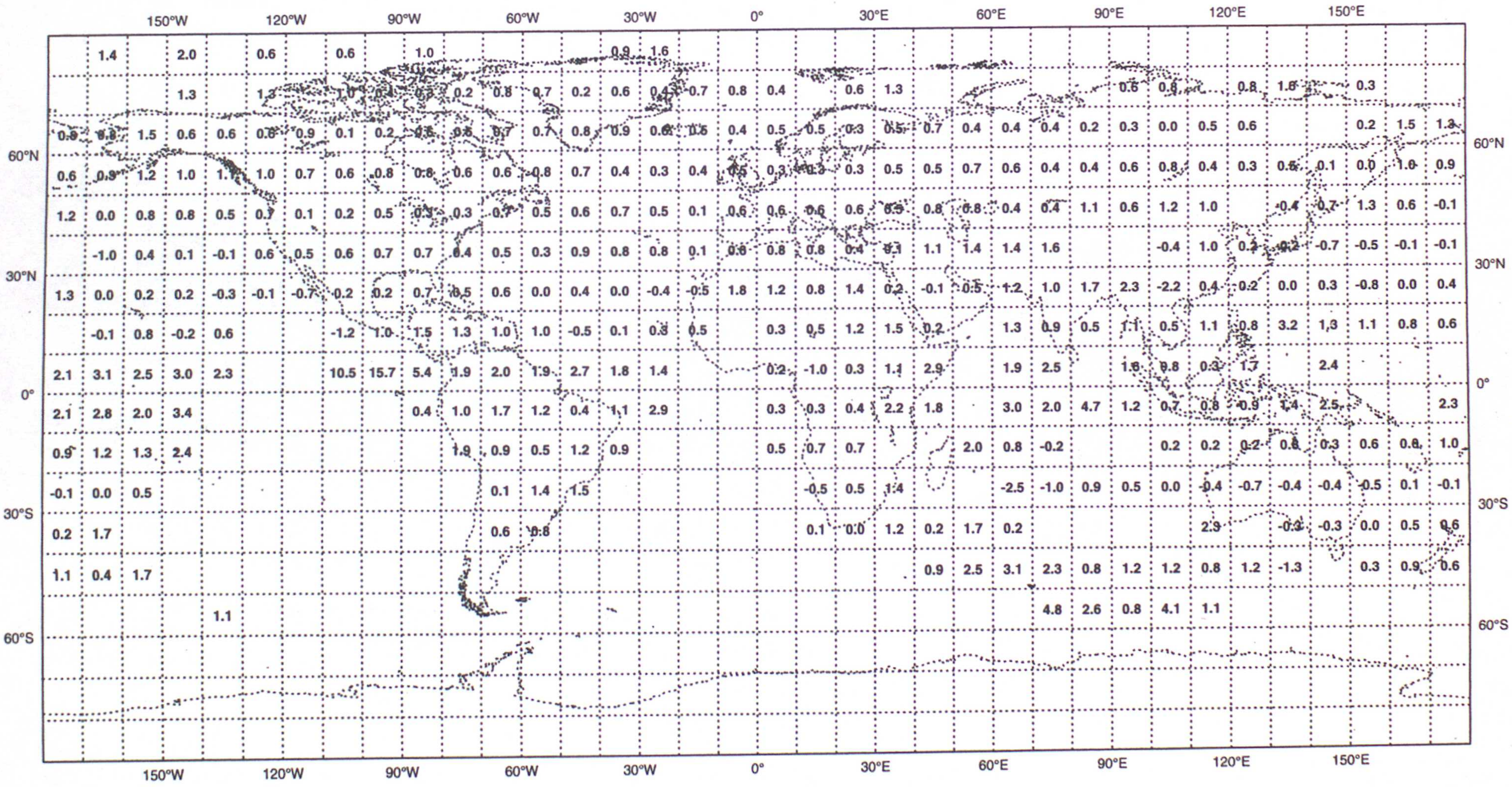

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

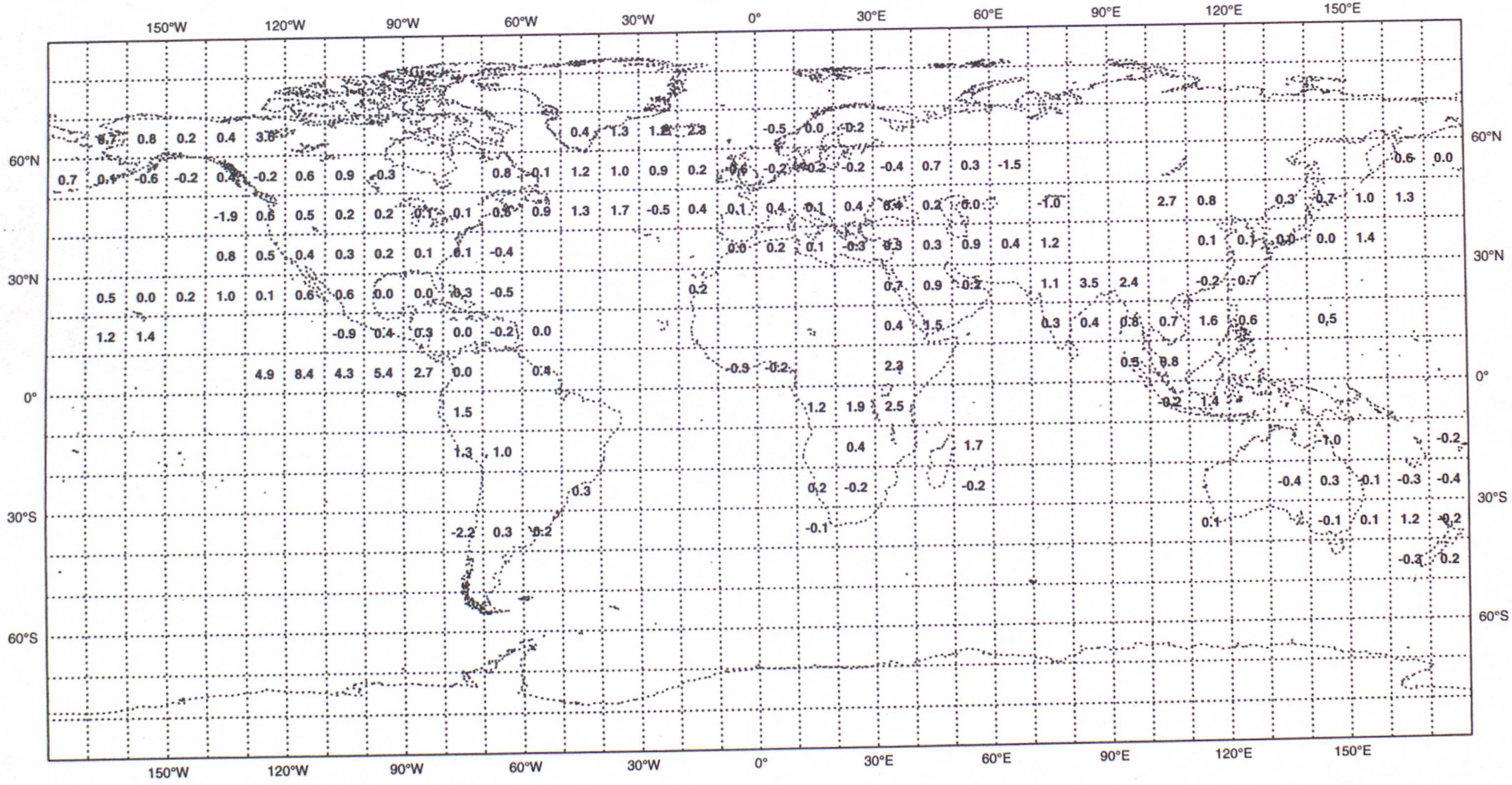
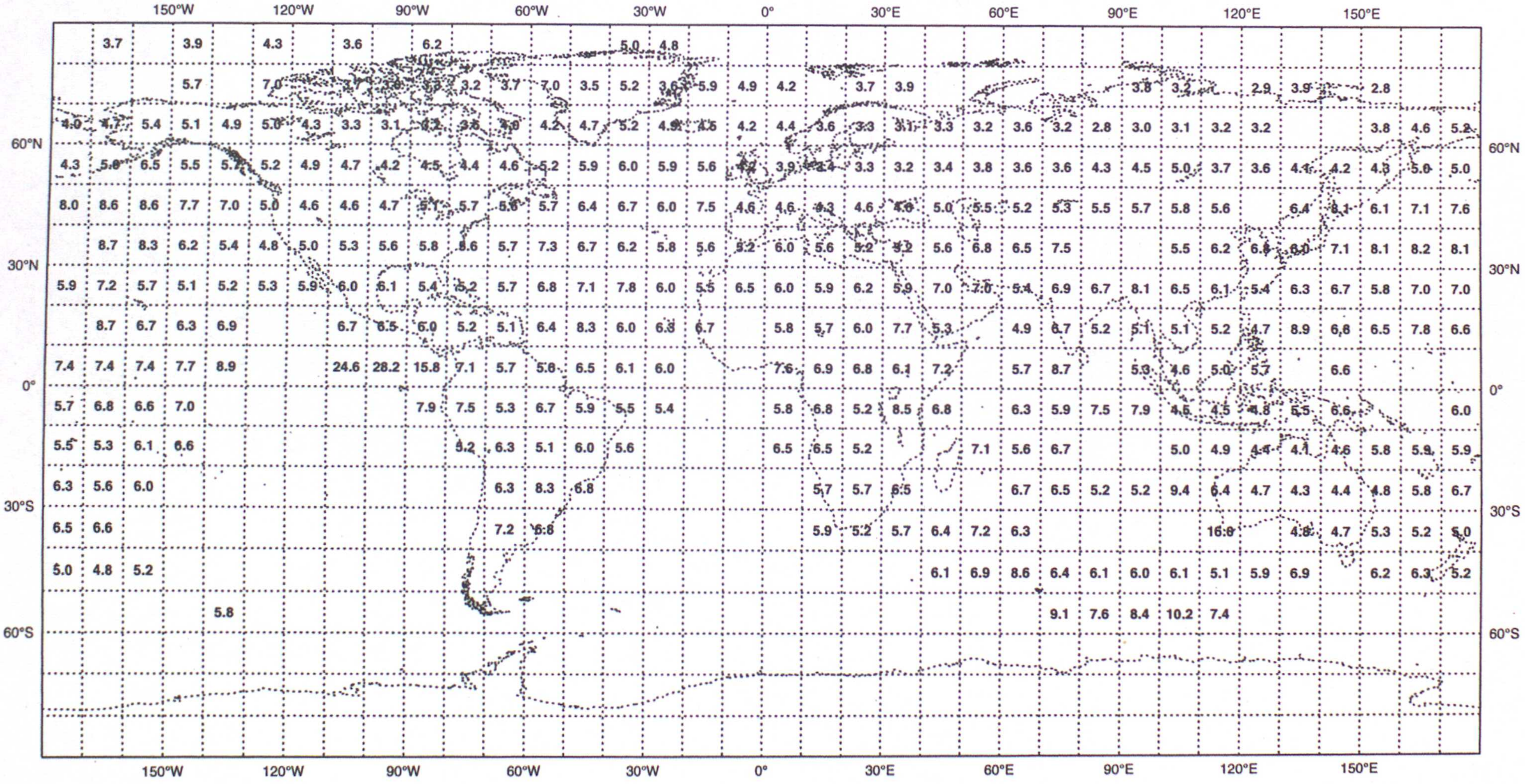

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.7 0.8 0.2 0.4 3.6 0.4 1.3 1.2 2.3 -0.5 0.0 -0.2
0.7 0.1 -0.6 -0.2 0.4 -0.2 0.6 0.9 -0.3 0.8 -0.1 1.2 1.0 0.9 0.2 -0.6 -0.2 -0.2 -0.2 -0.4 0.7 0.3 -1.5 0.6 0.0
-1.9 0.6 0.5 0.2 0.2 0.1 0.1 0.6 0.9 1.3 1.7 -0.5 0.4 0.1 0.4 0.1 0.4 0.4 0.2 0.0 -1.0 2.7 0.8 0.3 0.7 1.0 1.3
0.8 0.5 0.4 0.3 0.2 0.1 0.1 -0.4 0.0 0.2 0.1 -0.3 0.3 0.3 0.9 0.4 1.2 0.1 0.1 0.0 0.0 1.4
0.5 0.0 0.2 1.0 0.1 0.6 0.6 0.0 0.0 0.3 -0.5 0.2 0.7 0.9 0.2 1.1 3.5 2.4 -0.2 0.7
1.2 1.4 -0.9 0.4 0.3 0.0 -0.2 0.0 0.4 1.5 0.3 0.4 0.8 0.7 1.6 0.6 0.5
4.9 8.4 4.3 5.4 2.7 0.0 0.4 -0.9 -0.2 2.3 0.5 0.8
1.5 1.2 1.9 2.5 0.2 1.4
1.3 1.0 0.4 1.7 1.0 -0.2
0.3 0.2 -0.2 -0.2 -0.4 0.3 0.1 -0.3 -0.4
-2.2 0.3 0.2 -0.1 0.1 -0.1 0.1 1.2 0.2
-0.3 0.2

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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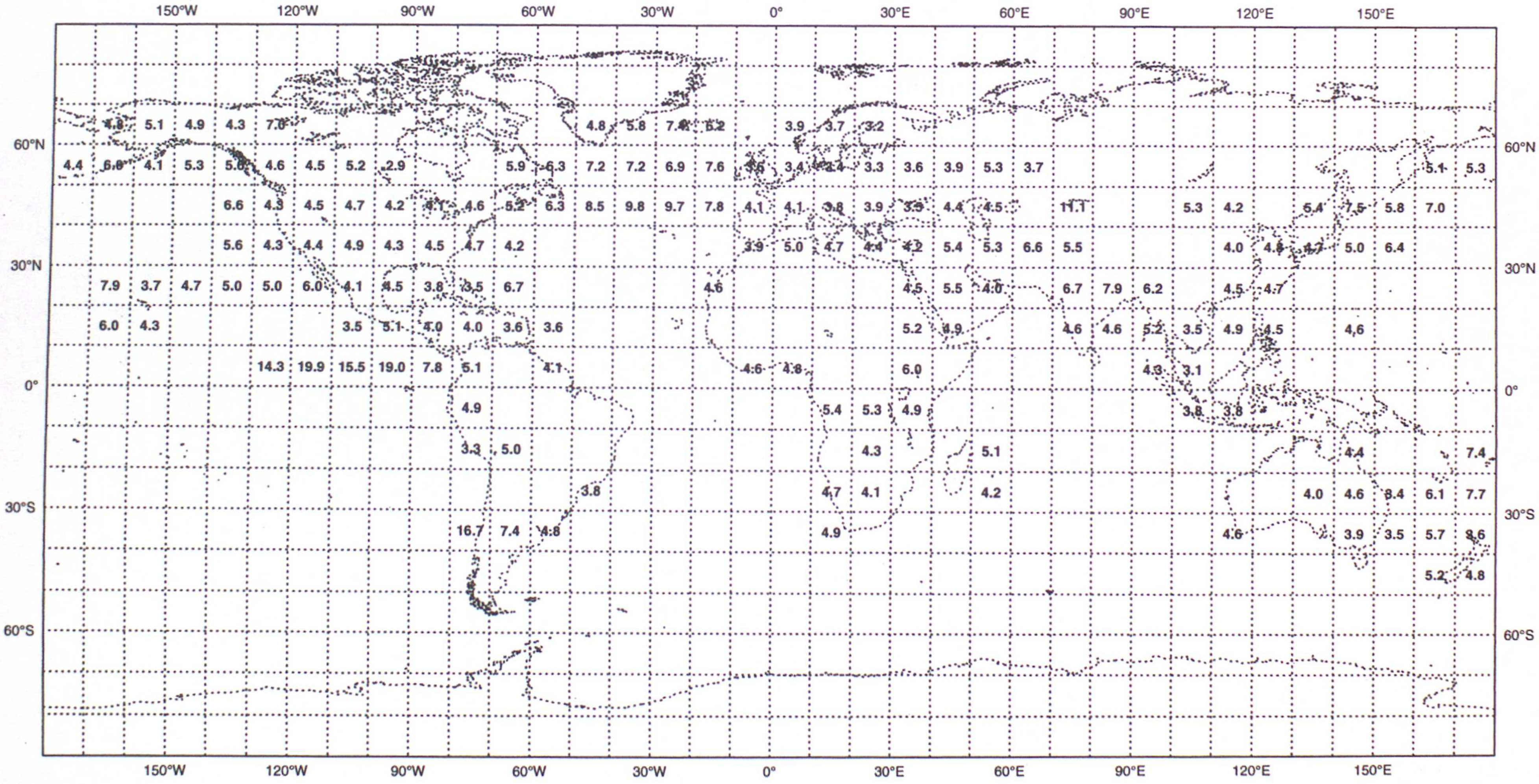
60°N 30°N 0° 30°S 60°S
3.7 3.9 4.3 3.6 6.2 5.0 4.8
5.7 7.0 3.2 3.7 7.0 3.5 5.2 3.6 5.9 4.9 4.2 3.7 3.9 3.8 3.2 2.9 3.9 2.8
4.0 4.7 5.4 5.1 4.9 5.0 4.3 3.3 3.1 4.2 3.6 4.0 4.2 4.7 5.2 4.9 4.5 4.2 4.4 3.6 3.3 3.1 3.3 3.2 3.6 3.2 2.8 3.0 3.1 3.2 3.2 3.8 4.6 5.2
4.3 5.0 6.5 5.5 5.7 5.2 4.9 4.7 4.2 4.5 4.4 4.6 5.2 5.9 6.0 5.9 5.6 4.2 3.9 3.4 3.3 3.2 3.4 3.8 3.6 3.6 4.3 4.5 5.0 3.7 3.6 4.1 4.2 4.3 5.0 5.0
8.0 8.6 8.6 7.7 7.0 5.0 4.6 4.6 4.7 5.1 5.7 5.8 5.7 6.4 6.7 6.0 7.5 4.6 4.6 4.3 4.6 4.6 5.0 5.5 5.2 5.3 5.5 5.7 5.8 5.6 6.4 8.1 6.1 7.1 7.6
8.7 8.3 6.2 5.4 4.8 5.0 5.3 5.6 5.8 8.6 5.7 7.3 6.7 6.2 5.8 5.6 5.2 6.0 5.6 5.2 5.2 5.6 6.8 6.5 7.5 5.5 6.2 6.8 6.0 7.1 8.1 8.2 8.1
5.9 7.2 5.7 5.1 5.2 5.3 5.9 6.0 6.1 5.4 5.2 5.7 6.8 7.1 7.8 6.0 5.5 6.5 6.0 5.9 6.2 5.9 7.0 7.0 5.4 6.9 6.7 8.1 6.5 6.1 5.4 6.3 6.7 5.8 7.0 7.0
8.7 6.7 6.3 6.9 6.7 6.5 6.0 5.2 5.1 6.4 8.3 6.0 6.8 6.7 5.8 5.7 6.0 7.7 5.3 4.9 6.7 5.2 5.1 5.1 5.2 4.7 8.9 6.8 6.5 7.8 6.6
7.4 7.4 7.4 7.7 8.9 24.6 28.2 15.8 7.1 5.7 5.8 6.5 6.1 6.0 7.6 6.9 6.8 6.1 7.2 5.7 8.7 5.3 4.6 5.0 5.7 6.6
5.7 6.8 6.6 7.0 7.9 7.5 5.3 6.7 5.9 5.5 5.4 5.8 6.8 5.2 8.5 6.8 6.3 5.9 7.5 7.9 4.5 4.5 4.8 6.5 6.6 6.0
5.5 5.3 6.1 6.6 5.2 6.3 5.1 6.0 5.6 6.5 6.5 5.2 7.1 5.6 6.7 5.0 4.9 4.4 4.1 4.6 5.8 5.9 5.9
6.3 5.6 6.0 6.3 8.3 6.8 5.7 5.7 6.5 6.7 6.5 5.2 5.2 9.4 6.4 4.7 4.3 4.4 4.8 5.8 6.7
6.5 6.6 7.2 6.8 5.9 5.2 5.7 6.4 7.2 6.3 16.0 4.8 4.7 5.3 5.2 5.0
5.0 4.8 5.2 6.1 6.9 8.6 6.4 6.1 6.0 6.1 5.1 5.9 6.9 6.2 6.3 5.2
5.8 9.1 7.6 8.4 10.2 7.4

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). APRIL 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present


150°W
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90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.8 5.1 4.9 4.3 7.0 4.8 5.8 7.4 5.2 3.9 3.7 3.2
4.4 6.0 4.1 5.3 5.6 4.6 4.5 5.2 2.9 5.9 6.3 7.2 7.2 6.9 7.6 3.6 3.4 3.4 3.3 3.6 3.9 5.3 3.7 5.1 5.3
6.6 4.3 4.5 4.7 4.2 4.1 4.6 5.2 6.3 8.5 9.8 9.7 7.8 4.1 4.1 3.8 3.9 3.9 4.4 4.5 11.1 5.3 4.2 5.4 7.5 5.8 7.0
5.6 4.3 4.4 4.9 4.3 4.5 4.7 4.2 3.9 5.0 4.7 4.4 4.2 5.4 5.3 6.6 5.5 4.0 4.8 4.7 5.0 6.4
7.9 3.7 4.7 5.0 5.0 6.0 4.1 4.5 3.8 3.5 6.7 4.6 4.5 5.5 4.0 6.7 7.9 6.2 4.5 4.7
6.0 4.3 3.5 5.1 4.0 4.0 3.6 3.6 5.2 4.9 4.6 4.6 5.2 3.5 4.9 4.5 4,6
14.3 19.9 15.5 19.0 7.8 5.1 4.1 4.6 4.8 6.0 4.3 3.1
4.9 5.4 5.3 4.9 3.8 3.8
3.3 5.0 4.3 5.1 4.4 7.4
3.8 4.7 4.1 4.2 4.0 4.6 8.4 6.1 7.7
16.7 7.4 4.8 4.9 4.6 3.9 3.5 5.7 8.6
5.2 4.8

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

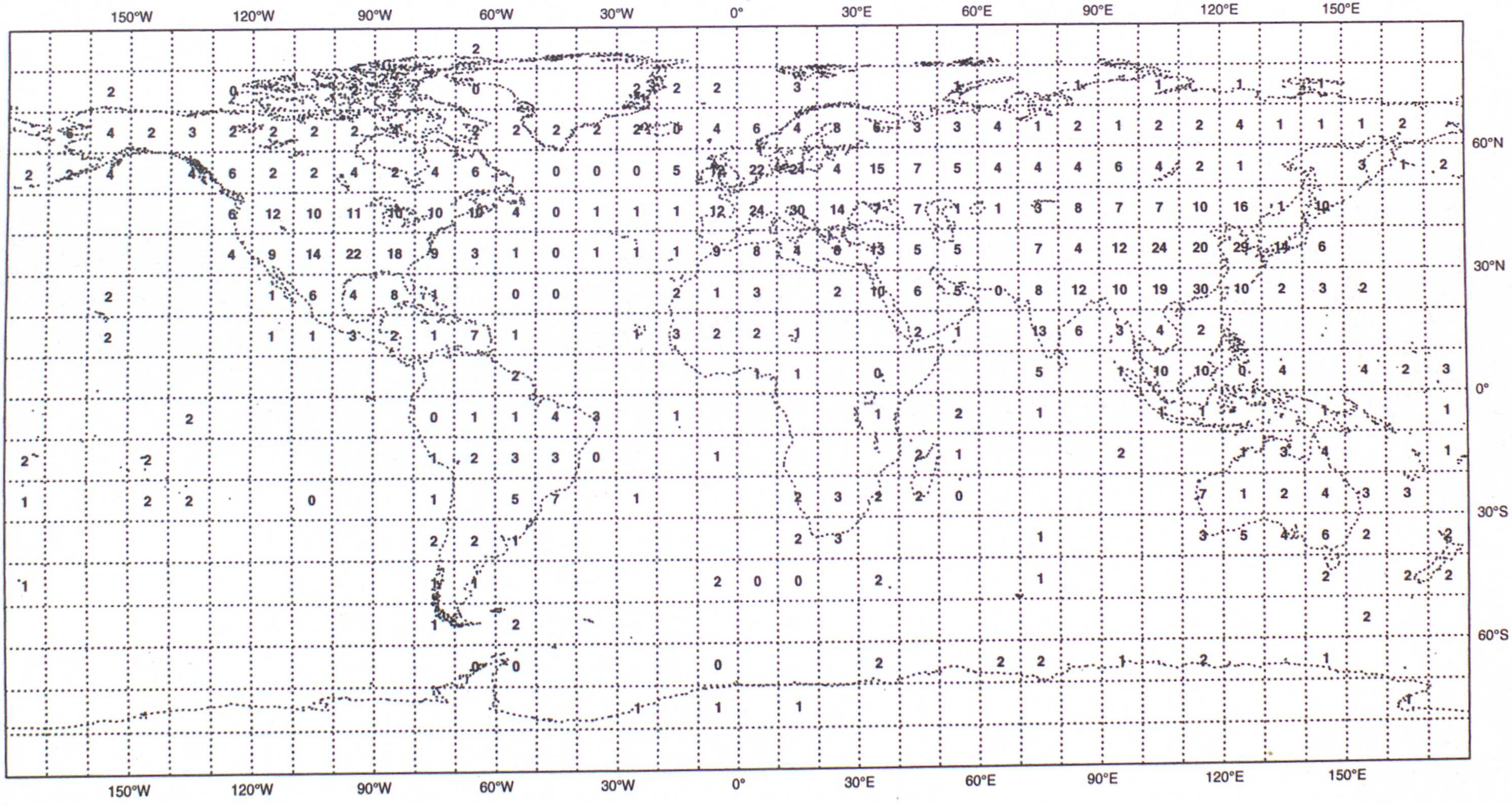
GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
27459	12	Z	1000	56/ 44	29	1	28.9	-22.0	36.3	5
34247	12	Z	1000	50/ 41	29	0	27.2	-32.8	42.6	7
42027	12	Z	200	34/ 75	11	0	89.4	-35.3	96.1	4
42101	00	Z	50	30/ 76	20	0	131.8	58.3	144.2	6
42101	12	Z	50	30/ 76	12	0	150.0	124.4	194.9	6
42182	00	Z	1000	29/ 77	1	25	0.0	95.0	95.0	11
42182	12	Z	850	29/ 77	28	1	34.2	43.5	55.4	10
42314	12	Z	200	27/ 95	11	0	50.8	-87.6	101.3	4
42339	00	Z	200	26/ 73	19	0	96.8	-95.5	135.9	8
42339	12	Z	250	26/ 73	21	0	89.1	-8.5	89.6	6
42361	12	Z	150	26/ 78	13	0	97.4	-81.8	127.2	7
42369	00	Z	1000	27/ 81	14	12	13.4	-76.0	77.2	8
42369	12	Z	1000	27/ 81	10	12	6.4	-89.3	89.5	8
42379	00	Z	200	27/ 83	17	0	68.3	-87.5	111.0	6
42410	00	Z	250	26/ 92	17	0	77.7	-33.1	84.5	4
42647	00	Z	150	23/ 73	11	1	144.4	17.5	145.5	4
42647	12	Z	200	23/ 73	9	2	50.6	97.2	109.6	7
42701	12	Z	200	23/ 85	19	1	93.1	-15.1	94.3	6
42724	00	Z	200	24/ 91	18	0	90.7	-27.7	94.8	7
42809	00	Z	100	23/ 88	10	0	121.2	93.3	153.0	6
42867	00	Z	250	21/ 79	14	0	52.6	-55.9	76.7	4
42867	12	Z	200	21/ 79	12	0	110.2	-2.4	110.2	5
42971	00	Z	30	20/ 86	11	1	118.2	202.5	234.4	7
42971	12	Z	30	20/ 86	10	0	94.4	244.8	262.4	5
43003	00	Z	1000	19/ 73	28	1	13.8	-79.5	80.7	6
43003	12	Z	1000	19/ 73	23	7	10.9	-84.1	84.8	11
43014	00	Z	250	20/ 75	18	1	87.6	53.1	102.5	5
43014	12	Z	200	20/ 75	14	3	56.5	96.5	111.8	6
43128	00	Z	50	17/ 78	24	1	117.7	107.1	159.1	9
43128	12	Z	70	17/ 78	15	5	112.2	183.6	215.2	12
43150	12	Z	1000	18/ 83	4	25	36.8	-73.5	82.2	5
43185	00	Z	200	16/ 81	15	0	100.4	30.6	105.0	8
43185	12	Z	150	16/ 81	12	1	105.0	133.1	169.5	10
43279	00	Z	70	13/ 80	12	0	140.0	110.4	178.3	7
43279	12	Z	50	13/ 80	10	1	106.0	206.6	232.2	12
43285	12	Z	250	13/ 75	18	0	74.6	100.6	125.2	8
43295	00	Z	850	13/ 78	29	0	23.4	27.2	35.9	4
43295	12	Z	50	13/ 78	15	0	183.0	146.5	234.4	12
43346	12	Z	250	11/ 80	9	1	53.1	85.8	100.9	6
43353	00	Z	1000	10/ 76	15	10	8.7	-87.3	87.7	4
43353	12	Z	1000	10/ 76	7	19	7.1	-92.1	92.4	6
43369	00	Z	250	8/ 73	20	0	103.9	-14.3	104.9	5
43371	00	Z	200	8/ 77	26	0	71.1	-136.5	153.9	10
43371	12	Z	50	8/ 77	12	0	111.7	167.2	201.1	7
47058	00	Z	1000	39/ 126	21	6	22.0	-40.5	46.1	4
83746	12	Z	1000	-23/ -43	13	13	20.7	-75.5	78.3	4
92044	00	Z	300	-2/ 147	4	1	67.4	-39.8	78.2	5

Figure 8. TEMP 500 hPa geopotential mean daily count. APRIL 2004
All hours
Global average number of observations in 24 hours = 1172


150°W
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60°W
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0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
06260	12	V	500	52/ 5	24	1	4	0.5	-2.5	16.4	1
40582	12	V	150	29/ 48	13	0	15	-11.0	0.6	29.8	1
41859	00	V	700	26/ 89	10	0	100	-11.0	5.7	15.8	1
42182	12	V	100	29/ 77	11	0	100	6.4	-9.9	19.4	2
42369	12	V	100	27/ 81	10	0	100	1.5	-3.5	16.5	1
42379	00	V	250	27/ 83	17	0	100	-4.1	-6.8	18.4	2
42379	12	V	150	27/ 83	11	0	100	-2.5	-8.4	18.2	3
42410	00	V	250	26/ 92	13	0	100	6.6	6.3	19.5	2
48327	00	V	150	19/ 99	30	0	6	-3.4	-0.1	17.8	1
48407	12	V	150	15/ 105	10	0	100	-10.3	3.2	15.4	1
60360	12	V	200	37/ 8	11	0	100	11.9	2.4	19.6	3
60390	00	V	150	37/ 3	29	0	3	-2.3	1.4	17.8	1
60620	12	V	300	28/ 0	11	0	100	-22.7	-2.0	26.9	3
62378	00	V	200	30/ 31	30	0	100	-16.2	0.4	20.4	3
62378	12	V	200	30/ 31	30	0	100	-16.7	0.1	20.8	4
62403	00	V	150	26/ 33	27	0	44	-2.0	0.8	25.2	1
62423	00	V	150	27/ 28	26	0	42	-7.3	3.4	34.4	1
62423	12	V	150	27/ 28	28	0	42	-7.8	4.9	33.2	1
68263	12	V	300	-26/ 28	9	1	33	12.5	-1.9	30.2	3
68442	12	V	300	-29/ 26	11	1	100	1.8	3.7	20.2	3
68588	12	V	250	-30/ 31	15	0	6	-0.3	4.2	16.0	1
72376	12	V	300	37/-108	27	0	100	-0.1	-3.2	16.7	2
78073	12	V	300	25/ -77	17	0	23	-1.2	-0.4	19.5	2

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. APRIL 2004
All hours
Global average number of observations in 24 hours = 1338

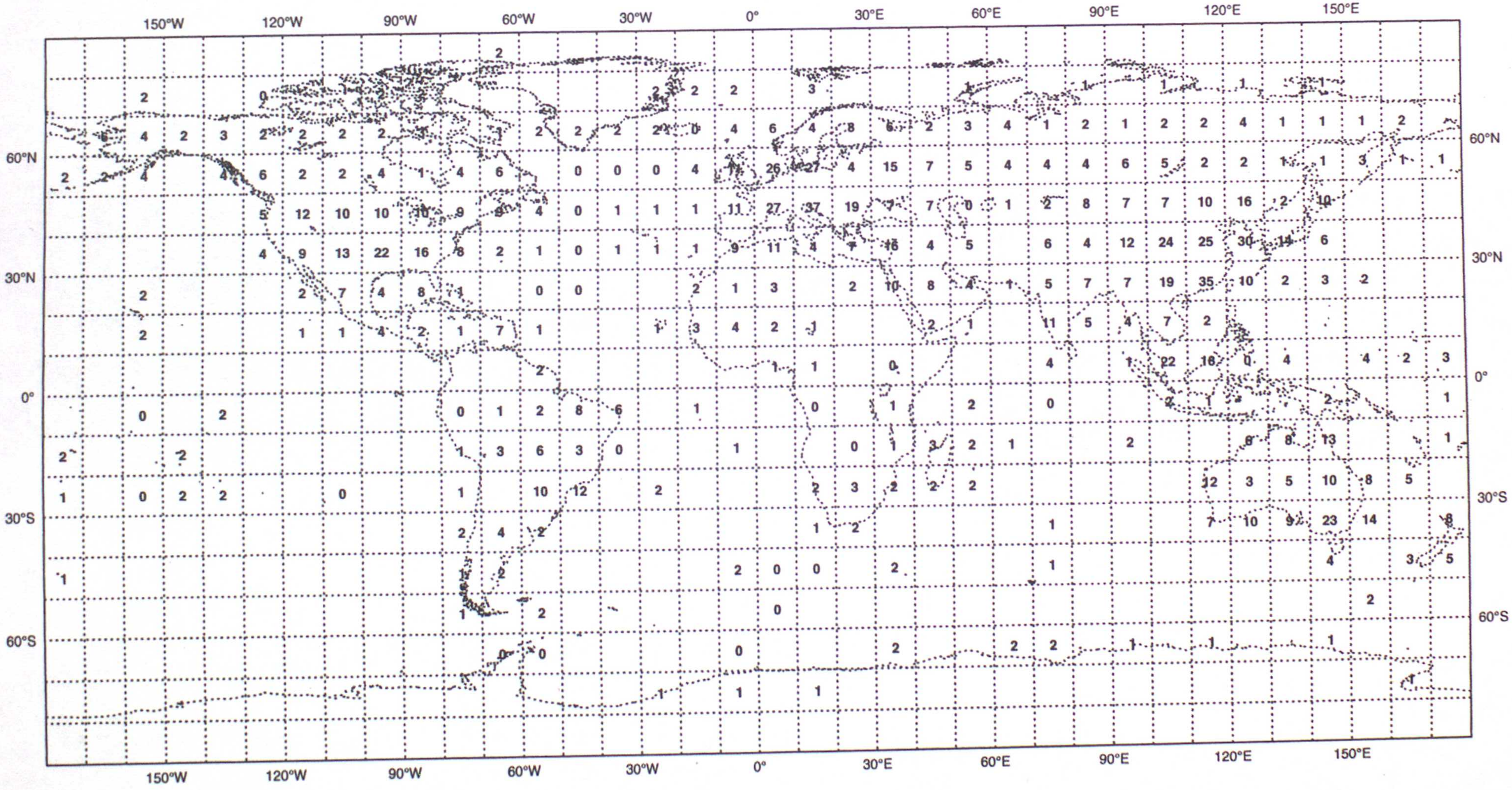

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	24	-14.7	2.2	9.1
42182	00	DD	29/ 77	23	11.2	7.8	18.9
42182	12	DD	29/ 77	22	11.6	4.6	17.0
60419	12	DD	36/ 7	5	-13.4	4.9	7.9
60566	12	DD	32/ 4	8	19.3	2.7	17.8
62337	00	DD	31/ 34	13	-16.7	4.2	6.7
62337	12	DD	31/ 34	24	-17.0	1.7	6.3
78397	12	DD	18/ -77	13	10.0	5.8	10.2
78954	12	DD	13/ -59	20	-16.0	3.8	15.2

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

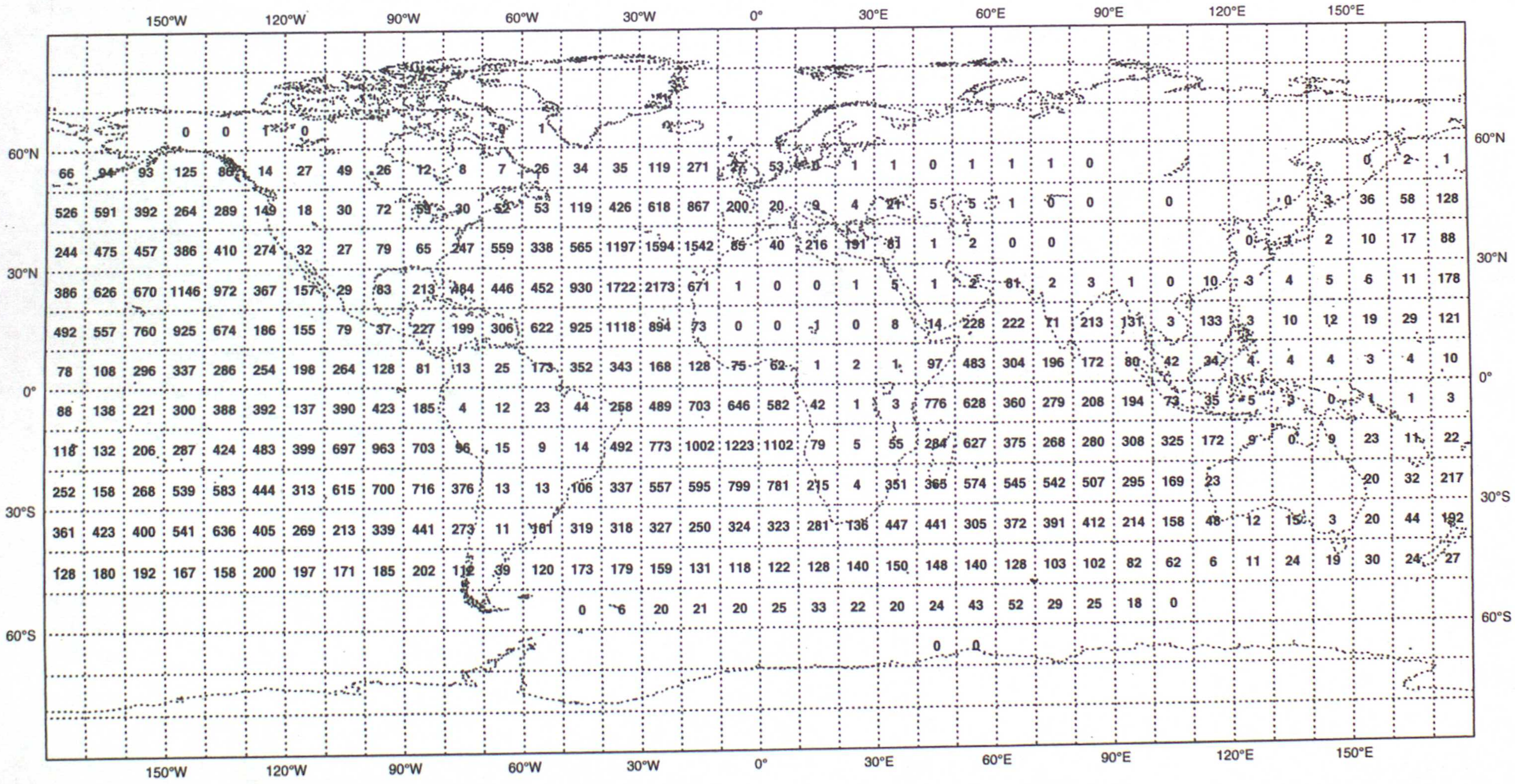
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. APRIL 2004
Global average number of observations in 24 hours = 87979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60°N 30°N 0° 30°S 60°S
0 0 1 0 0 1
66 94 93 125 86 14 27 49 26 12 8 7 26 34 35 119 271 27 53 0 1 1 0 1 1 1 0 0 2 1
526 591 392 264 289 149 18 30 72 59 30 52 53 119 426 618 867 200 20 9 4 21 5 5 1 0 0 0 0 3 36 58 128
244 475 457 386 410 274 32 27 79 65 247 559 338 565 1197 1594 1542 85 40 216 191 81 1 2 0 0 0 1 2 10 17 88
386 626 670 1146 972 367 157 29 83 213 484 446 452 930 1722 2173 671 1 0 0 1 5 1 2 81 2 3 1 0 10 3 4 5 6 11 178
492 557 760 925 674 186 155 79 37 227 199 306 622 925 1118 894 73 0 0 1 0 8 14 228 222 71 213 131 3 133 3 10 12 19 29 121
78 108 296 337 286 254 198 264 128 81 13 25 173 352 343 168 128 75 62 1 2 1 97 483 304 196 172 80 42 34 4 4 4 3 4 10
88 138 221 300 388 392 137 390 423 185 4 12 23 44 258 489 703 646 582 42 1 3 776 628 360 279 208 194 73 35 5 3 0 1 1 3
118 132 206 287 424 483 399 697 963 703 96 15 9 14 492 773 1002 1223 1102 79 5 55 284 627 375 268 280 308 325 172 9 0 9 23 11 22
252 158 268 539 583 444 313 615 700 716 376 13 13 106 337 557 595 799 781 215 4 351 365 574 545 542 507 295 169 23 20 32 217
361 423 400 541 636 405 269 213 339 441 273 11 161 319 318 327 250 324 323 281 136 447 441 305 372 391 412 214 158 48 12 15 3 20 44 192
128 180 192 167 158 200 197 171 185 202 112 39 120 173 179 159 131 118 122 128 140 150 148 140 128 103 102 82 62 6 11 24 19 30 24 27
0 6 20 21 20 25 33 22 20 24 43 52 29 25 18 0
0 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

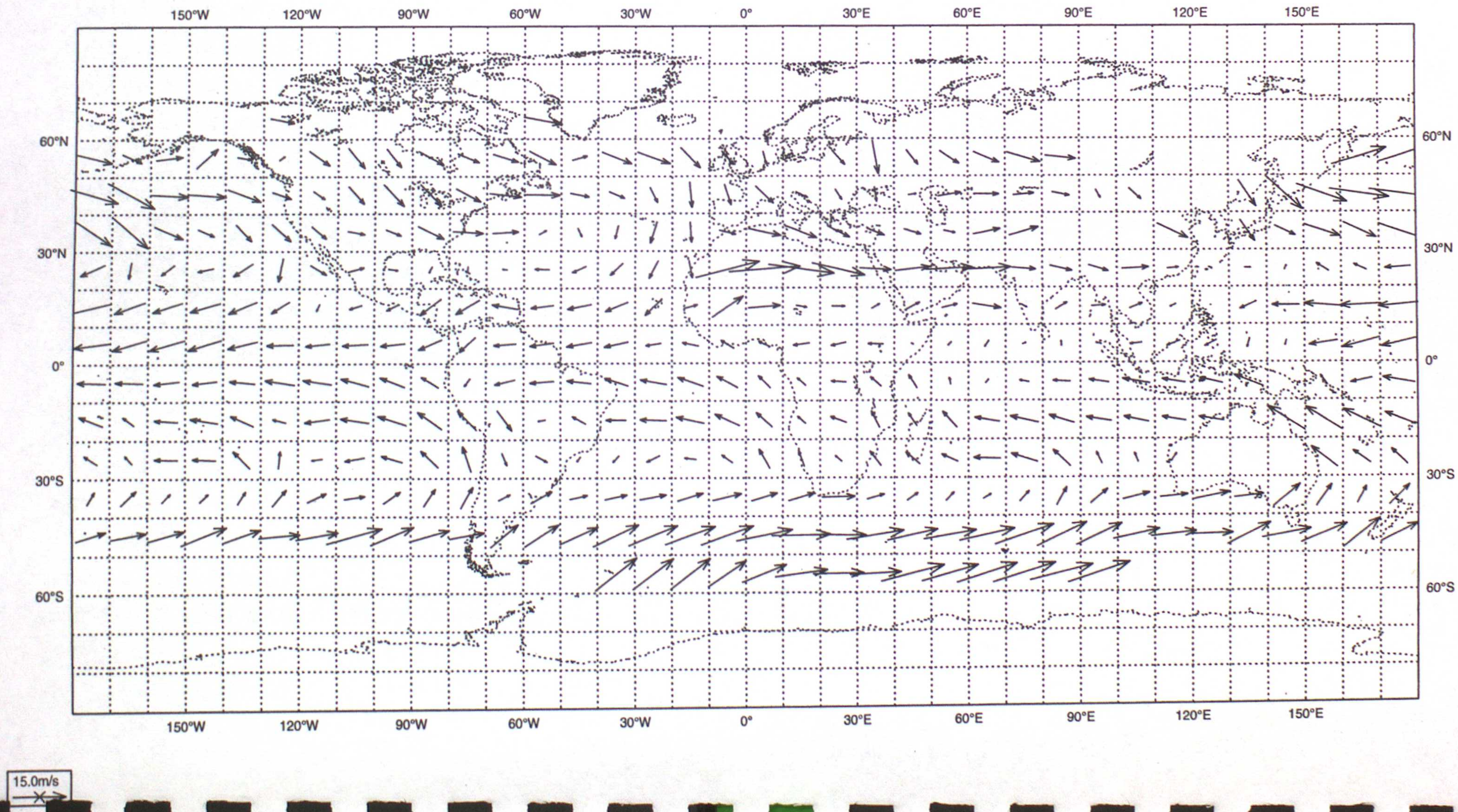

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

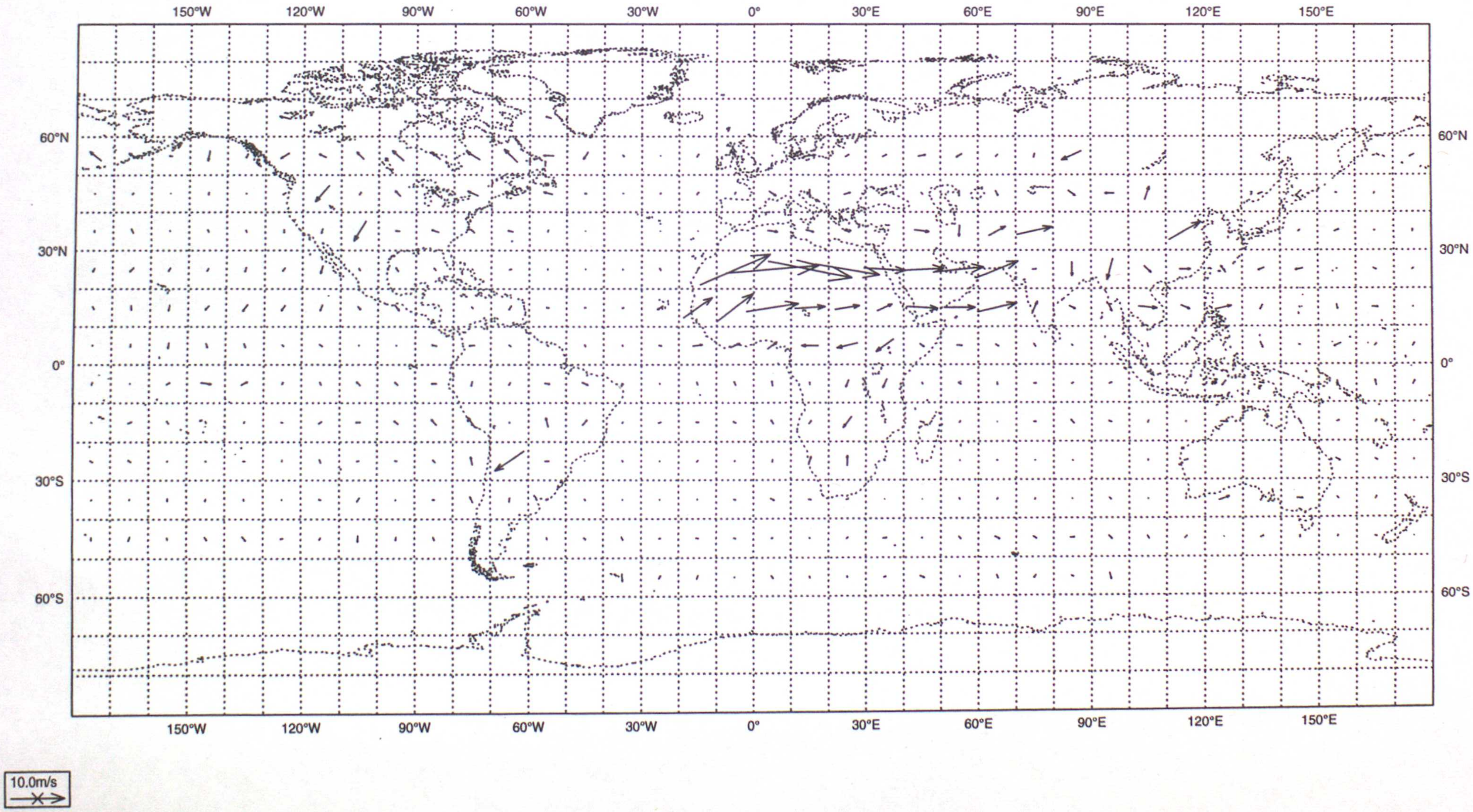

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present

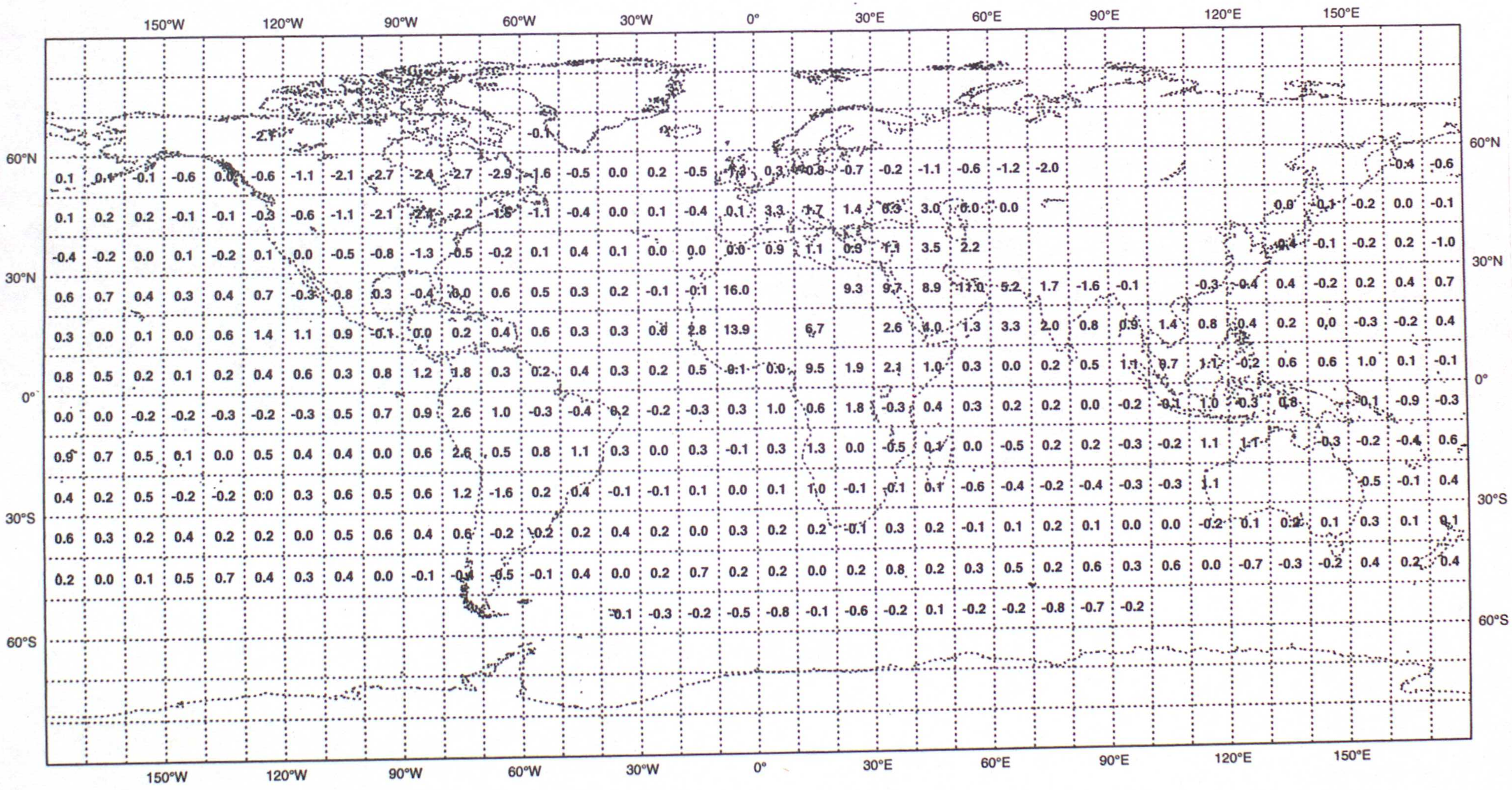

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-2.1 -0.1
0.1 0.1 -0.1 -0.6 0.0 -0.6 -1.1 -2.1 -2.7 -2.4 -2.7 -2.9 -1.6 -0.5 0.0 0.2 -0.5 1.3 0.3 -0.8 -0.7 -0.2 -1.1 -0.6 -1.2 -2.0 -0.4 -0.6
0.1 0.2 0.2 -0.1 -0.1 -0.3 -0.6 -1.1 -2.1 -2.4 -2.2 -1.6 -1.1 -0.4 0.0 0.1 -0.4 0.1 3.3 1.7 1.4 0.3 3.0 0.0 0.0 0.0 -0.1 -0.2 0.0 -0.1
-0.4 -0.2 0.0 0.1 -0.2 0.1 0.0 -0.5 -0.8 -1.3 -0.5 -0.2 0.1 0.4 0.1 0.0 0.0 0.0 0.9 1.1 0.9 1.1 3.5 2.2 0.4 -0.1 -0.2 0.2 -1.0
0.6 0.7 0.4 0.3 0.4 0.7 -0.3 -0.8 0.3 -0.4 0.0 0.6 0.5 0.3 0.2 -0.1 -0.1 16.0 9.3 9.7 8.9 11.0 5.2 1.7 -1.6 -0.1 -0.3 -0.4 0.4 -0.2 0.2 0.4 0.7
0.3 0.0 0.1 0.0 0.6 1.4 1.1 0.9 -0.1 0.0 0.2 0.4 0.6 0.3 0.3 0.0 2.8 13.9 6.7 2.6 4.0 1.3 3.3 2.0 0.8 0.9 1.4 0.8 0.4 0.2 0.0 -0.3 -0.2 0.4
0.8 0.5 0.2 0.1 0.2 0.4 0.6 0.3 0.8 1.2 1.8 0.3 0.2 0.4 0.3 0.2 0.5 0.1 0.0 9.5 1.9 2.1 1.0 0.3 0.0 0.2 0.5 1.1 0.7 1.1 -0.2 0.6 0.6 1.0 0.1 -0.1
0.0 0.0 -0.2 -0.2 -0.3 -0.2 -0.3 0.5 0.7 0.9 2.6 1.0 -0.3 -0.4 0.2 -0.2 -0.3 0.3 1.0 0.6 1.8 -0.3 0.4 0.3 0.2 0.2 0.0 -0.2 -0.1 1.0 -0.3 0.8 -0.1 -0.9 -0.3
0.9 0.7 0.5 0.1 0.0 0.5 0.4 0.4 0.0 0.6 2.6 0.5 0.8 1.1 0.3 0.0 0.3 -0.1 0.3 1.3 0.0 -0.5 0.1 0.0 -0.5 0.2 0.2 -0.3 -0.2 1.1 1.1 -0.3 -0.2 -0.4 0.6
0.4 0.2 0.5 -0.2 -0.2 0.0 0.3 0.6 0.5 0.6 1.2 -1.6 0.2 0.4 -0.1 -0.1 0.1 0.0 0.1 1.0 -0.1 -0.1 0.1 -0.6 -0.4 -0.2 -0.4 -0.3 -0.3 1.1 -0.5 -0.1 0.4
0.6 0.3 0.2 0.4 0.2 0.2 0.0 0.5 0.6 0.4 0.6 -0.2 0.2 0.2 0.4 0.2 0.0 0.3 0.2 0.2 -0.1 0.3 0.2 -0.1 0.1 0.2 0.1 0.0 0.0 -0.2 0.1 0.2 0.1 0.3 0.1 0.1
0.2 0.0 0.1 0.5 0.7 0.4 0.3 0.4 0.0 -0.1 -0.4 -0.5 -0.1 0.4 0.0 0.2 0.7 0.2 0.2 0.0 0.2 0.8 0.2 0.3 0.5 0.2 0.6 0.3 0.6 0.0 -0.7 -0.3 -0.2 0.4 0.2 0.4
-0.1 -0.3 -0.2 -0.5 -0.8 -0.1 -0.6 -0.2 0.1 -0.2 -0.2 -0.8 -0.7 -0.2

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present

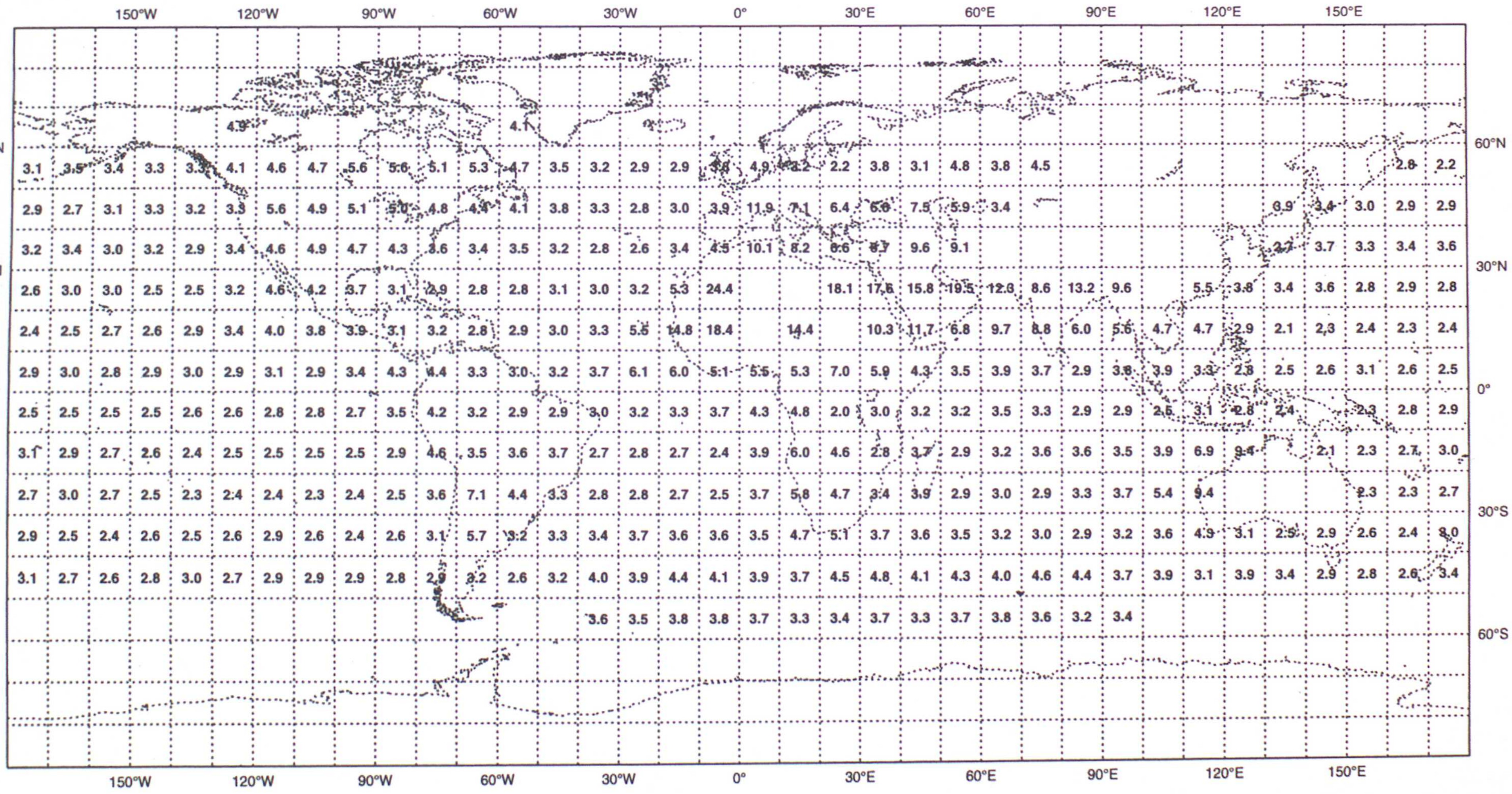
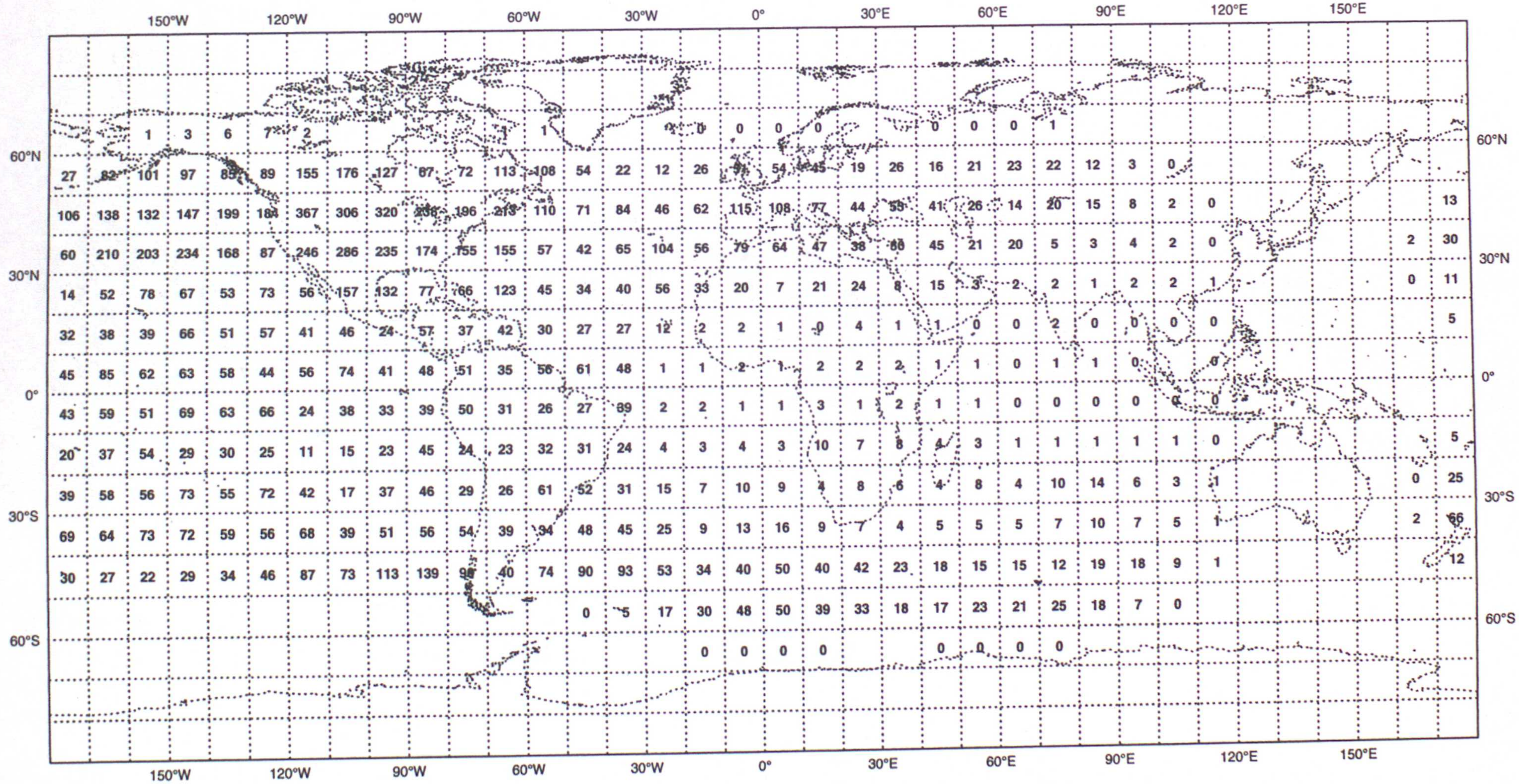

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.9 4.1
3.1 3.5 3.4 3.3 3.3 4.1 4.6 4.7 5.6 5.6 5.1 5.3 4.7 3.5 3.2 2.9 2.9 3.8 4.9 3.2 2.2 3.8 3.1 4.8 3.8 4.5 2.8 2.2
2.9 2.7 3.1 3.3 3.2 3.3 5.6 4.9 5.1 5.0 4.8 4.4 4.1 3.8 3.3 2.8 3.0 3.9 11.9 7.1 6.4 6.6 7.5 5.9 3.4 6.9 3.4 3.0 2.9 2.9
3.2 3.4 3.0 3.2 2.9 3.4 4.6 4.9 4.7 4.3 3.6 3.4 3.5 3.2 2.8 2.6 3.4 4.5 10.1 8.2 6.6 8.7 9.6 9.1 2.7 3.7 3.3 3.4 3.6
2.6 3.0 3.0 2.5 2.5 3.2 4.6 4.2 3.7 3.1 2.9 2.8 2.8 3.1 3.0 3.2 5.3 24.4 18.1 17.6 15.8 19.5 12.6 8.6 13.2 9.6 5.5 3.8 3.4 3.6 2.8 2.9 2.8
2.4 2.5 2.7 2.6 2.9 3.4 4.0 3.8 3.9 3.1 3.2 2.8 2.9 3.0 3.3 5.5 14.8 18.4 14.4 10.3 11.7 6.8 9.7 8.8 6.0 5.6 4.7 4.7 2.9 2.1 2.3 2.4 2.3 2.4
2.9 3.0 2.8 2.9 3.0 2.9 3.1 2.9 3.4 4.3 4.4 3.3 3.0 3.2 3.7 6.1 6.0 5.1 5.5 5.3 7.0 5.9 4.3 3.5 3.9 3.7 2.9 3.8 3.9 3.3 2.8 2.5 2.6 3.1 2.6 2.5
2.5 2.5 2.5 2.5 2.6 2.6 2.8 2.8 2.7 3.5 4.2 3.2 2.9 2.9 3.0 3.2 3.3 3.7 4.3 4.8 2.0 3.0 3.2 3.2 3.5 3.3 2.9 2.9 2.5 3.1 2.8 2.4 2.3 2.8 2.9
3.1 2.9 2.7 2.6 2.4 2.5 2.5 2.5 2.5 2.9 4.6 3.5 3.6 3.7 2.7 2.8 2.7 2.4 3.9 6.0 4.6 2.8 3.7 2.9 3.2 3.6 3.6 3.5 3.9 6.9 9.4 2.1 2.3 2.7 3.0
2.7 3.0 2.7 2.5 2.3 2.4 2.4 2.3 2.4 2.5 3.6 7.1 4.4 3.3 2.8 2.8 2.7 2.5 3.7 5.8 4.7 3.4 3.9 2.9 3.0 2.9 3.3 3.7 5.4 9.4 2.3 2.3 2.7
2.9 2.5 2.4 2.6 2.5 2.6 2.9 2.6 2.4 2.6 3.1 5.7 3.2 3.3 3.4 3.7 3.6 3.6 3.5 4.7 5.1 3.7 3.6 3.5 3.2 3.0 2.9 3.2 3.6 4.9 3.1 2.5 2.9 2.6 2.4 8.0
3.1 2.7 2.6 2.8 3.0 2.7 2.9 2.9 2.9 2.8 2.9 3.2 2.6 3.2 4.0 3.9 4.4 4.1 3.9 3.7 4.5 4.8 4.1 4.3 4.0 4.6 4.4 3.7 3.9 3.1 3.9 3.4 2.9 2.8 2.6 3.4
3.6 3.5 3.8 3.8 3.7 3.3 3.4 3.7 3.3 3.7 3.8 3.6 3.2 3.4

Figure 15. SATOB 401 - 700 hPa mean daily count. APRIL 2004
Global average number of observations in 24 hours = 15631



150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 3 6 7 2 1 1 0 0 0 0 0 0 0 1
27 82 101 97 85 89 155 176 127 87 72 113 108 54 22 12 26 91 54 45 19 26 16 21 23 22 12 3 0
106 138 132 147 199 184 367 306 320 288 196 218 110 71 84 46 62 115 108 77 44 55 41 26 14 20 15 8 2 0 13
60 210 203 234 168 87 246 286 235 174 155 155 57 42 65 104 56 79 64 47 38 88 45 21 20 5 3 4 2 0 2 30
14 52 78 67 53 73 56 157 132 77 166 123 45 34 40 56 33 20 7 21 24 8 15 3 2 2 1 2 2 1 0 11
32 38 39 66 51 57 41 46 24 57 37 42 30 27 27 12 2 2 1 0 4 1 1 0 0 2 0 0 0 0 5
45 85 62 63 58 44 56 74 41 48 51 35 56 61 48 1 1 2 1 2 2 2 1 1 0 1 1 0 0
43 59 51 69 63 66 24 38 33 39 50 31 26 27 89 2 2 1 1 3 1 2 1 1 0 0 0 0 0 0
20 37 54 29 30 25 11 15 23 45 24 23 32 31 24 4 3 4 3 10 7 8 4 3 1 1 1 1 1 0 5
39 58 56 73 55 72 42 17 37 46 29 26 61 52 31 15 7 10 9 4 8 6 4 8 4 10 14 6 3 1 0 25
69 64 73 72 59 56 68 39 51 56 54 39 34 48 45 25 9 13 16 9 7 4 5 5 5 7 10 7 5 1 2 66
30 27 22 29 34 46 87 73 113 139 98 40 74 90 93 53 34 40 50 40 42 23 18 15 15 12 19 18 9 1 12
0 5 17 30 48 50 39 33 18 17 23 21 25 18 7 0
0 0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

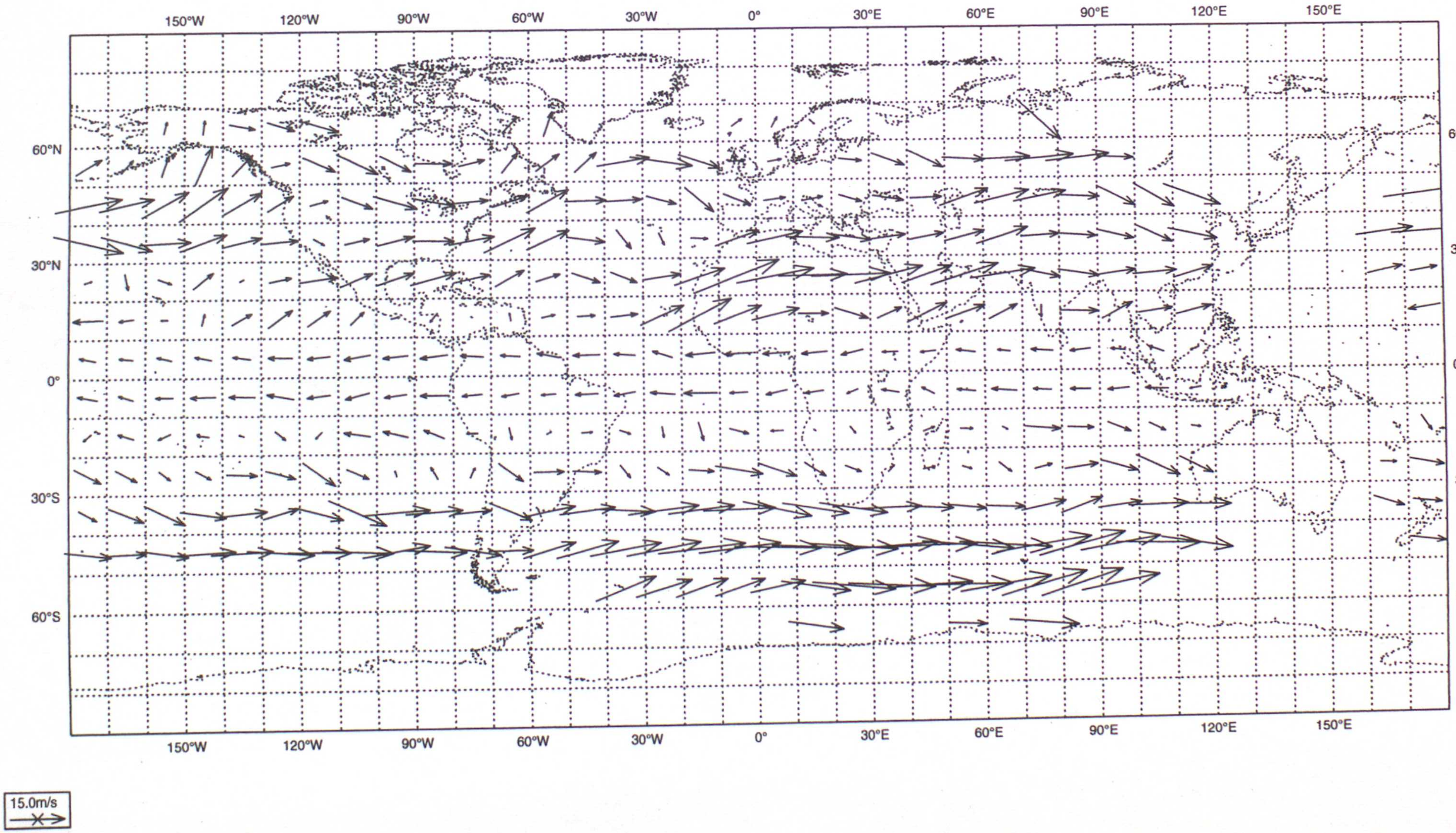

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

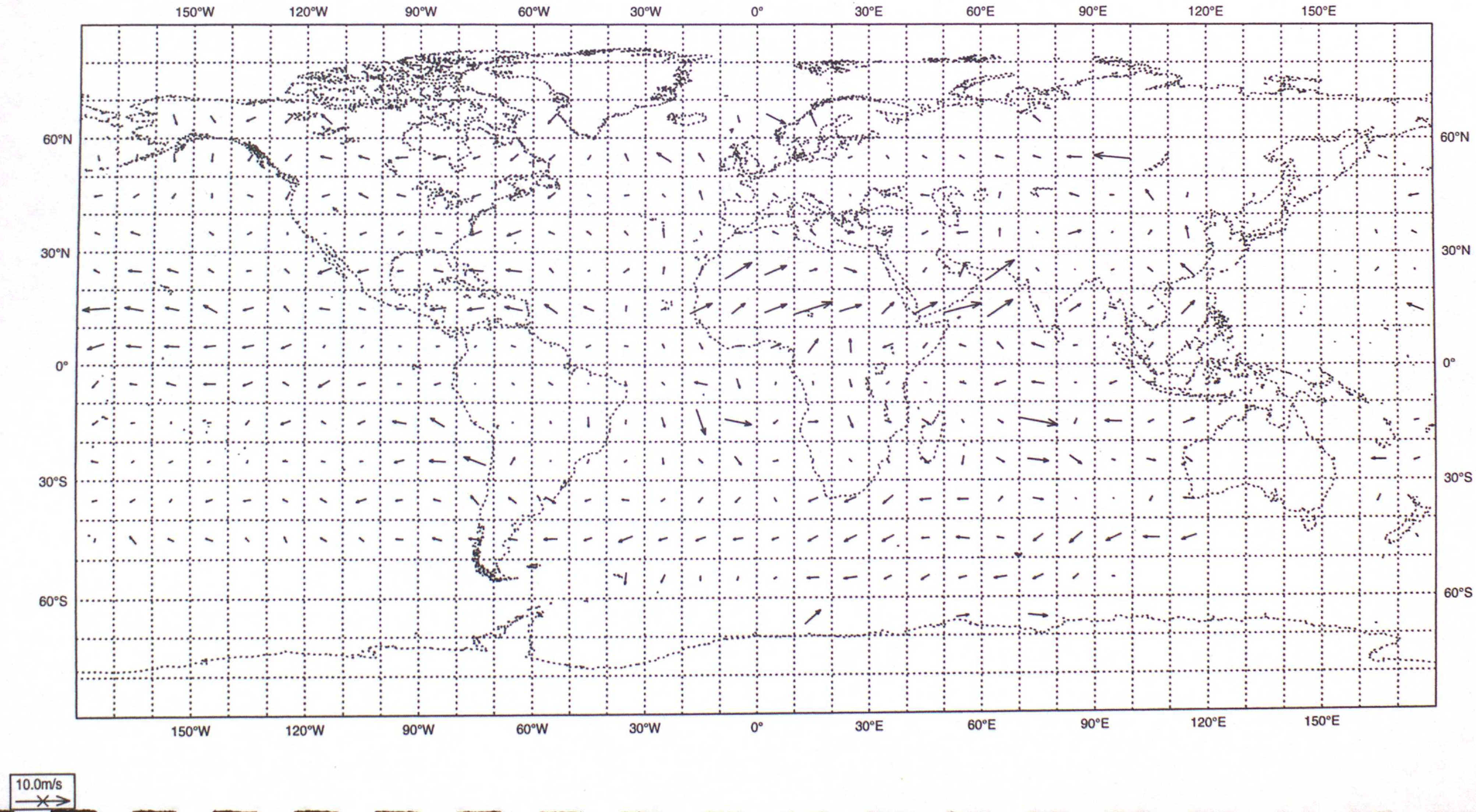

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present

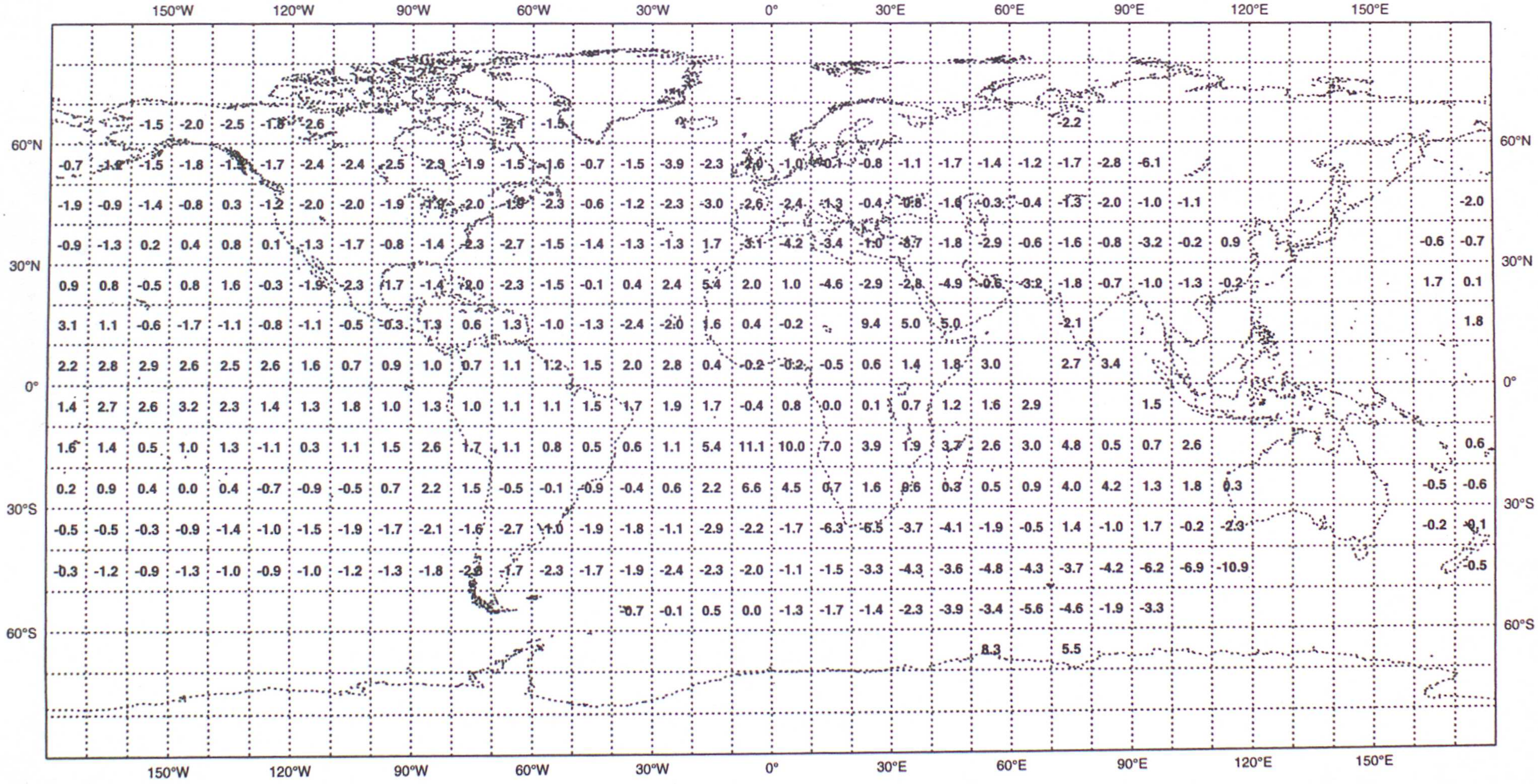

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.5 -2.0 -2.5 -1.8 -2.6 -2.1 -1.5 -2.2
-0.7 -1.8 -1.5 -1.8 -1.7 -1.7 -2.4 -2.4 -2.5 -2.9 -1.9 -1.5 -1.6 -0.7 -1.5 -3.9 -2.3 -2.0 -1.0 -0.1 -0.8 -1.1 -1.7 -1.4 -1.2 -1.7 -2.8 -6.1
-1.9 -0.9 -1.4 -0.8 0.3 -1.2 -2.0 -2.0 -1.9 -1.9 -2.0 -1.9 -2.3 -0.6 -1.2 -2.3 -3.0 -2.6 -2.4 -1.3 -0.4 -0.8 -1.6 -0.3 -0.4 -1.3 -2.0 -1.0 -1.1 -2.0
-0.9 -1.3 0.2 0.4 0.8 0.1 -1.3 -1.7 -0.8 -1.4 -2.3 -2.7 -1.5 -1.4 -1.3 -1.3 1.7 -3.1 -4.2 -3.4 -1.0 -3.7 -1.8 -2.9 -0.6 -1.6 -0.8 -3.2 -0.2 0.9 -0.6 -0.7
0.9 0.8 -0.5 0.8 1.6 -0.3 -1.9 -2.3 1.7 -1.4 -2.0 -2.3 -1.5 -0.1 0.4 2.4 5.4 2.0 1.0 -4.6 -2.9 -2.8 -4.9 -0.6 -3.2 -1.8 -0.7 -1.0 -1.3 -0.2 1.7 0.1
3.1 1.1 -0.6 -1.7 -1.1 -0.8 -1.1 -0.5 -0.3 1.3 0.6 1.3 -1.0 -1.3 -2.4 -2.0 1.6 0.4 -0.2 9.4 5.0 5.0 -2.1 1.8
2.2 2.8 2.9 2.6 2.5 2.6 1.6 0.7 0.9 1.0 0.7 1.1 1.2 1.5 2.0 2.8 0.4 -0.2 -0.2 -0.5 0.6 1.4 1.8 3.0 2.7 3.4
1.4 2.7 2.6 3.2 2.3 1.4 1.3 1.8 1.0 1.3 1.0 1.1 1.1 1.5 1.7 1.9 1.7 -0.4 0.8 0.0 0.1 0.7 1.2 1.6 2.9 1.5
1.6 1.4 0.5 1.0 1.3 -1.1 0.3 1.1 1.5 2.6 1.7 1.1 0.8 0.5 0.6 1.1 5.4 11.1 10.0 7.0 3.9 1.9 3.7 2.6 3.0 4.8 0.5 0.7 2.6 0.6
0.2 0.9 0.4 0.0 0.4 -0.7 -0.9 -0.5 0.7 2.2 1.5 -0.5 -0.1 -0.9 -0.4 0.6 2.2 6.6 4.5 0.7 1.6 0.6 0.3 0.5 0.9 4.0 4.2 1.3 1.8 0.3 -0.5 -0.6
-0.5 -0.5 -0.3 -0.9 -1.4 -1.0 -1.5 -1.9 -1.7 -2.1 -1.6 -2.7 -1.0 -1.9 -1.8 -1.1 -2.9 -2.2 -1.7 -6.3 -6.5 -3.7 -4.1 -1.9 -0.5 1.4 -1.0 1.7 -0.2 -2.3 -0.2 -0.1
-0.3 -1.2 -0.9 -1.3 -1.0 -0.9 -1.0 -1.2 -1.3 -1.8 -2.8 -1.7 -2.3 -1.7 -1.9 -2.4 -2.3 -2.0 -1.1 -1.5 -3.3 -4.3 -3.6 -4.8 -4.3 -3.7 -4.2 -6.2 -6.9 -10.9 -0.5
-0.7 -0.1 0.5 0.0 -1.3 -1.7 -1.4 -2.3 -3.9 -3.4 -5.6 -4.6 -1.9 -3.3
8.3 5.5

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present

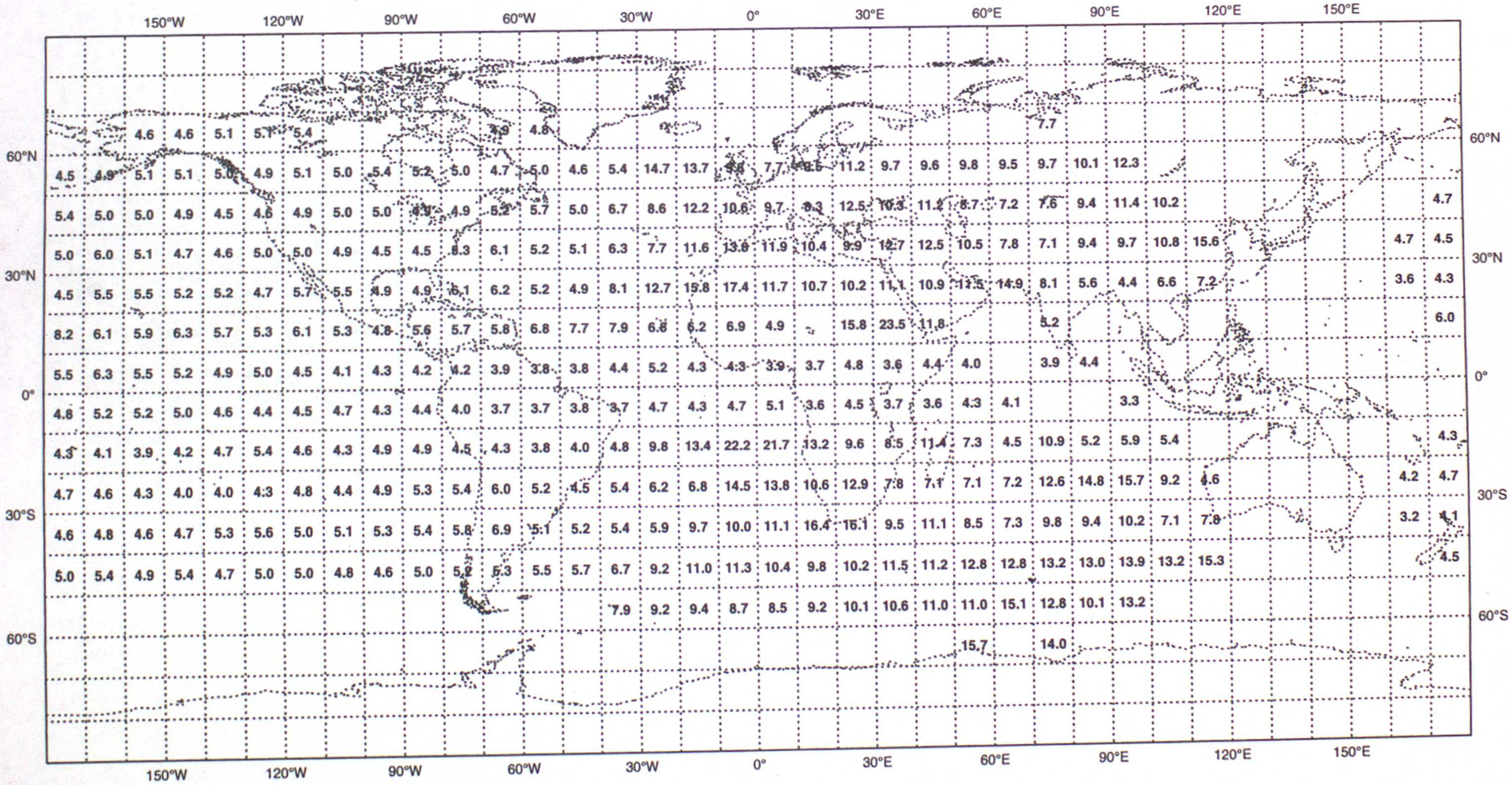
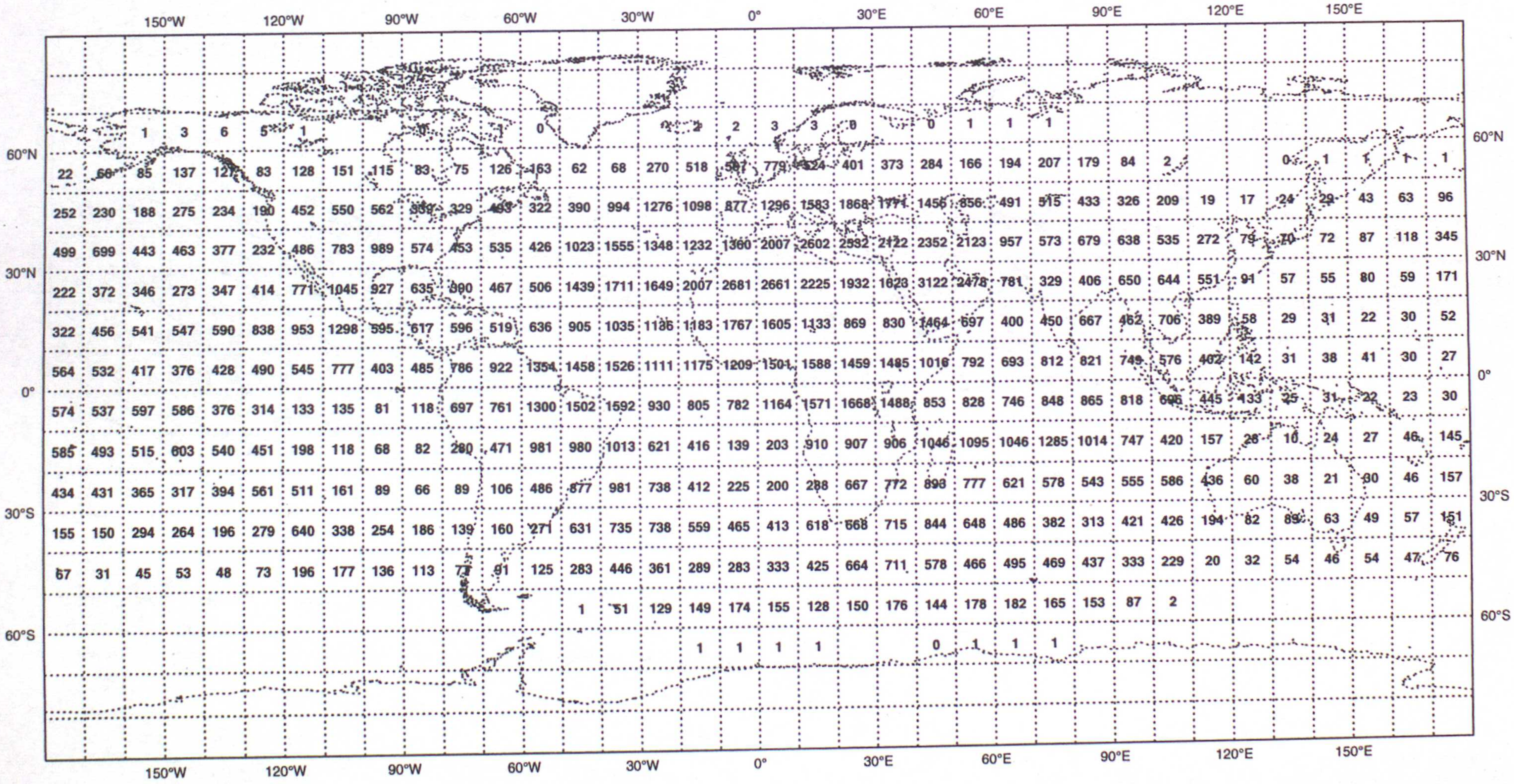

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.6 4.6 5.1 5.1 5.4 4.9 4.8 7.7
4.5 4.9 5.1 5.1 5.0 4.9 5.1 5.0 5.4 5.2 5.0 4.7 5.0 4.6 5.4 14.7 13.7 4.8 7.7 8.5 11.2 9.7 9.6 9.8 9.5 9.7 10.1 12.3
5.4 5.0 5.0 4.9 4.5 4.6 4.9 5.0 5.0 4.9 4.9 5.2 5.7 5.0 6.7 8.6 12.2 10.6 9.7 8.3 12.5 10.3 11.4 8.7 7.2 7.6 9.4 11.4 10.2 4.7
5.0 6.0 5.1 4.7 4.6 5.0 5.0 4.9 4.5 4.5 8.3 6.1 5.2 5.1 6.3 7.7 11.6 13.8 11.9 10.4 9.9 12.7 12.5 10.5 7.8 7.1 9.4 9.7 10.8 15.6 4.7 4.5
4.5 5.5 5.5 5.2 5.2 4.7 5.7 5.5 4.9 4.9 6.1 6.2 5.2 4.9 8.1 12.7 15.8 17.4 11.7 10.7 10.2 11.1 10.9 11.5 14.9 8.1 5.6 4.4 6.6 7.2 3.6 4.3
8.2 6.1 5.9 6.3 5.7 5.3 6.1 5.3 4.8 5.6 5.7 5.8 6.8 7.7 7.9 6.8 6.2 6.9 4.9 15.8 23.5 11.8 5.2 6.0
5.5 6.3 5.5 5.2 4.9 5.0 4.5 4.1 4.3 4.2 4.2 3.9 3.8 3.8 4.4 5.2 4.3 4.3 3.9 3.7 4.8 3.6 4.4 4.0 3.9 4.4
4.8 5.2 5.2 5.0 4.6 4.4 4.5 4.7 4.3 4.4 4.0 3.7 3.7 3.8 3.7 4.7 4.3 4.7 5.1 3.6 4.5 3.7 3.6 4.3 4.1 3.3
4.3 4.1 3.9 4.2 4.7 5.4 4.6 4.3 4.9 4.9 4.5 4.3 3.8 4.0 4.8 9.8 13.4 22.2 21.7 13.2 9.6 8.5 11.4 7.3 4.5 10.9 5.2 5.9 5.4 4.3
4.7 4.6 4.3 4.0 4.0 4.3 4.8 4.4 4.9 5.3 5.4 6.0 5.2 4.5 5.4 6.2 6.8 14.5 13.8 10.6 12.9 7.8 7.1 7.1 7.2 12.6 14.8 15.7 9.2 4.6 4.2 4.7
4.6 4.8 4.6 4.7 5.3 5.6 5.0 5.1 5.3 5.4 5.8 6.9 5.1 5.2 5.4 5.9 9.7 10.0 11.1 16.4 16.1 9.5 11.1 8.5 7.3 9.8 9.4 10.2 7.1 7.8 3.2 4.1
5.0 5.4 4.9 5.4 4.7 5.0 5.0 4.8 4.6 5.0 5.2 5.3 5.5 5.7 6.7 9.2 11.0 11.3 10.4 9.8 10.2 11.5 11.2 12.8 12.8 13.2 13.0 13.9 13.2 15.3 4.5
7.9 9.2 9.4 8.7 8.5 9.2 10.1 10.6 11.0 11.0 15.1 12.8 10.1 13.2
15.7 14.0

Figure 20. SATOB 101 - 400 hPa mean daily count. APRIL 2004
Global average number of observations in 24 hours = 223817



		1	3	6	5	1			0		1	0				2	2	3	3	0		0	1	1	1										
22	66	85	137	127	83	128	151	115	83	75	126	163	62	68	270	518	567	779	524	401	373	284	166	194	207	179	84	2			0	1	1	1	1
252	230	188	275	234	190	452	550	562	339	329	493	322	390	994	1276	1098	877	1296	1583	1868	1771	1456	856	491	515	433	326	209	19	17	24	29	43	63	96
499	699	443	463	377	232	486	783	989	574	453	535	426	1023	1555	1348	1232	1360	2007	2602	2582	2122	2352	2123	957	573	679	638	535	272	79	70	72	87	118	345
222	372	346	273	347	414	771	1045	927	635	390	467	506	1439	1711	1649	2007	2681	2661	2225	1932	1623	3122	2478	781	329	406	650	644	551	91	57	55	80	59	171
322	456	541	547	590	838	953	1298	595	617	596	519	636	905	1035	1136	1183	1767	1605	1133	869	830	1464	697	400	450	667	462	706	389	58	29	31	22	30	52
564	532	417	376	428	490	545	777	403	485	786	922	1354	1458	1526	1111	1175	1209	1501	1588	1459	1485	1016	792	693	812	821	749	576	402	142	31	38	41	30	27
574	537	597	586	376	314	133	135	81	118	697	761	1300	1502	1592	930	805	782	1164	1571	1668	1488	853	828	746	848	865	818	696	445	433	25	31	22	23	30
585	493	515	603	540	451	198	118	68	82	280	471	981	980	1013	621	416	139	203	910	907	906	1046	1095	1046	1285	1014	747	420	157	28	10	24	27	46	145
434	431	365	317	394	561	511	161	89	66	89	106	486	877	981	738	412	225	200	288	667	772	898	777	621	578	543	555	586	436	60	38	21	30	46	157
155	150	294	264	196	279	640	338	254	186	139	160	271	631	735	738	559	465	413	618	668	715	844	648	486	382	313	421	426	194	82	89	63	49	57	151
67	31	45	53	48	73	196	177	136	113	73	91	125	283	446	361	289	283	333	425	664	711	578	466	495	469	437	333	229	20	32	54	46	54	47	76
													1	51	129	149	174	155	128	150	176	144	178	182	165	153	87	2							
																1	1	1	1			0	1	1	1										

Figure 21. SATOB 101 - 400 hPa vector mean wind. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

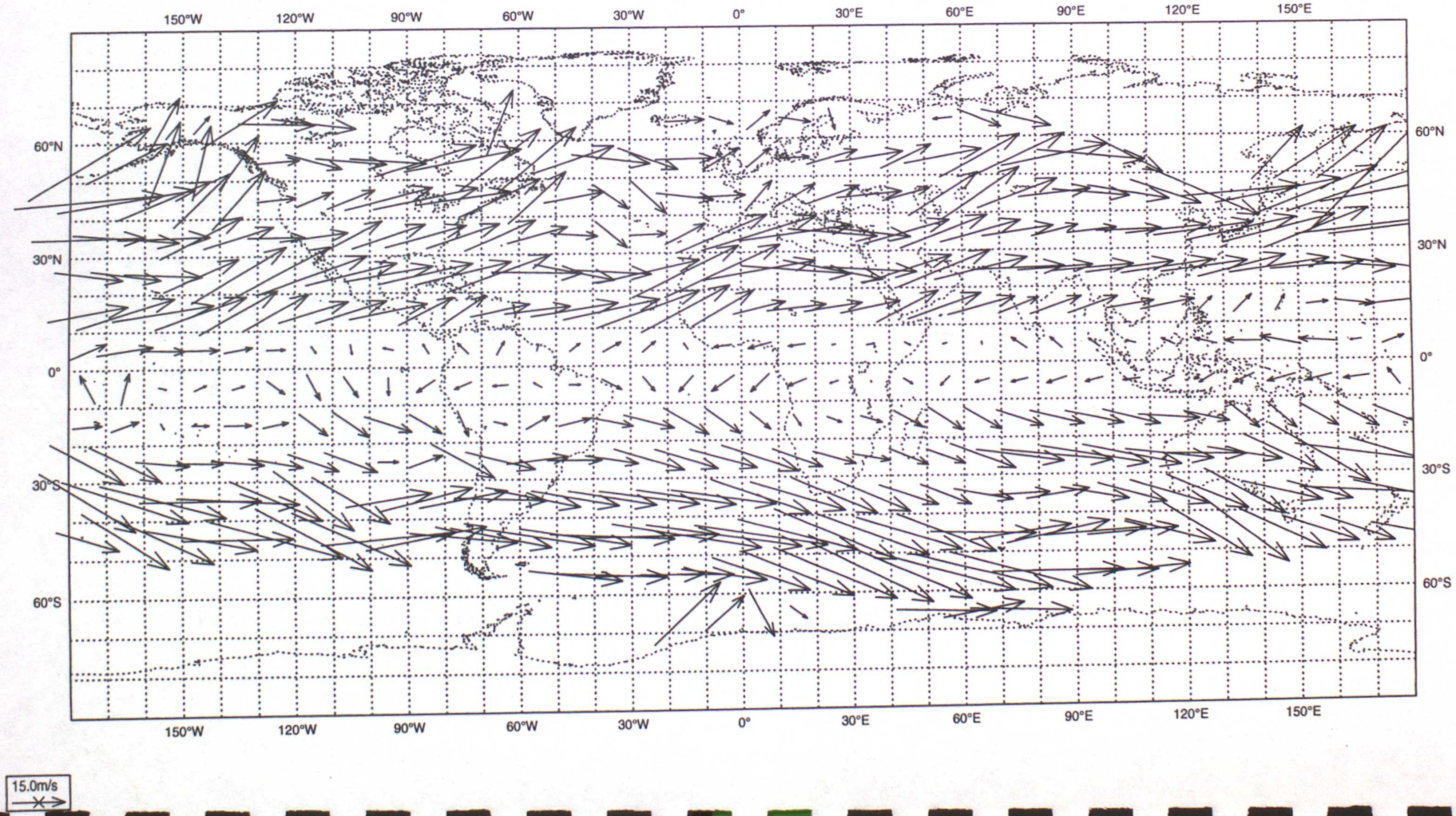

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. APRIL 2004
All observations
Arrows are plotted where greater than 10 obs are present

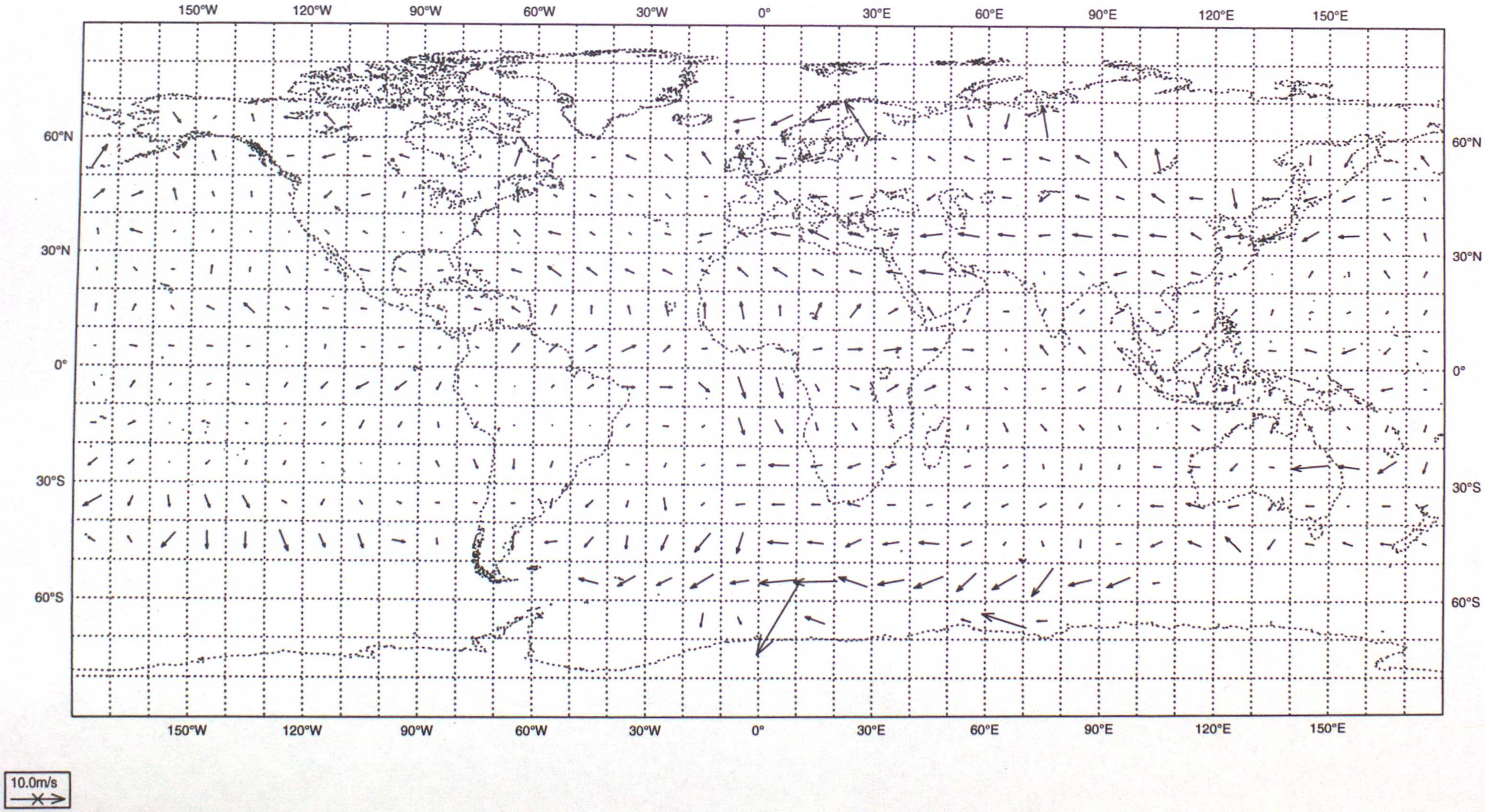

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present

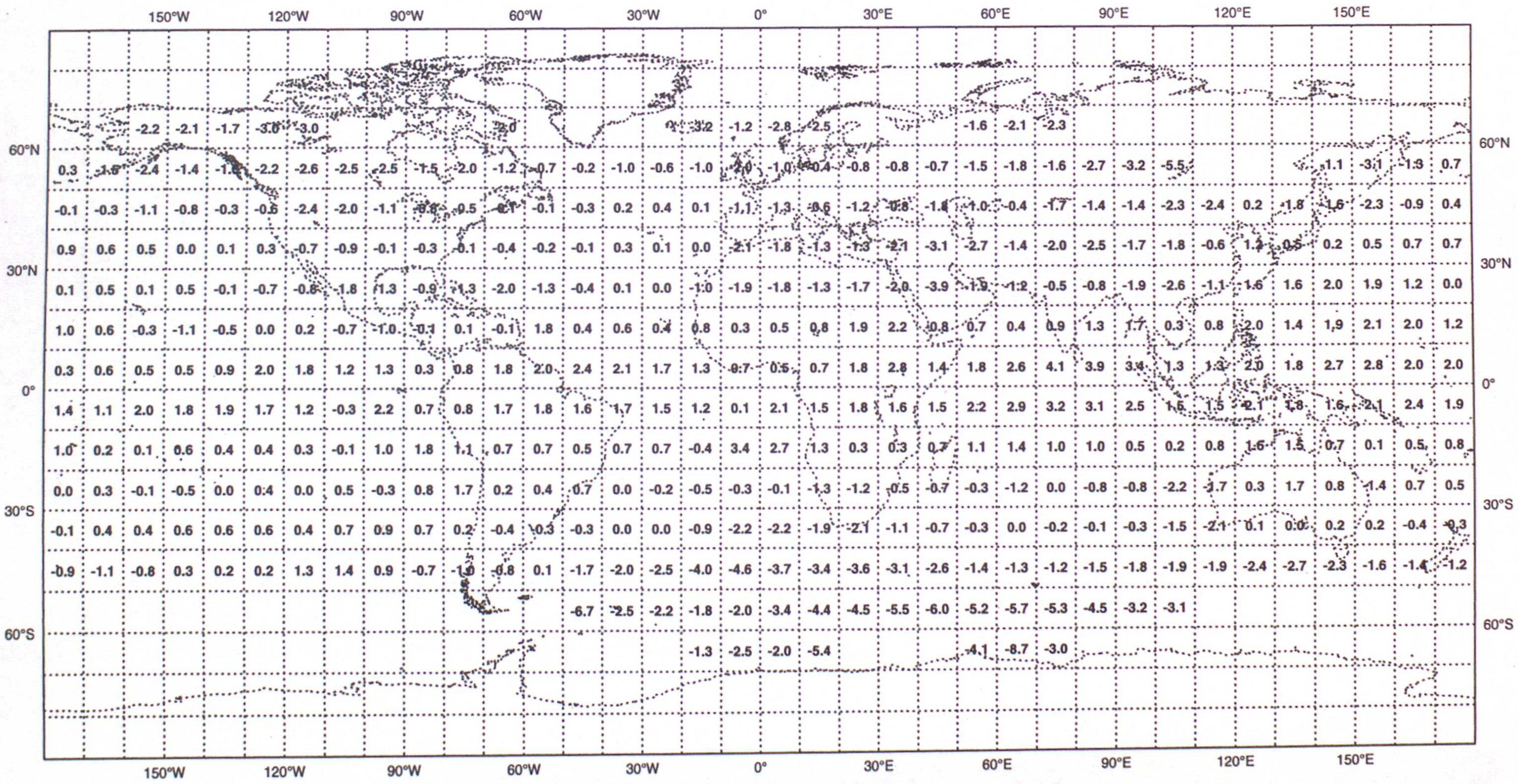
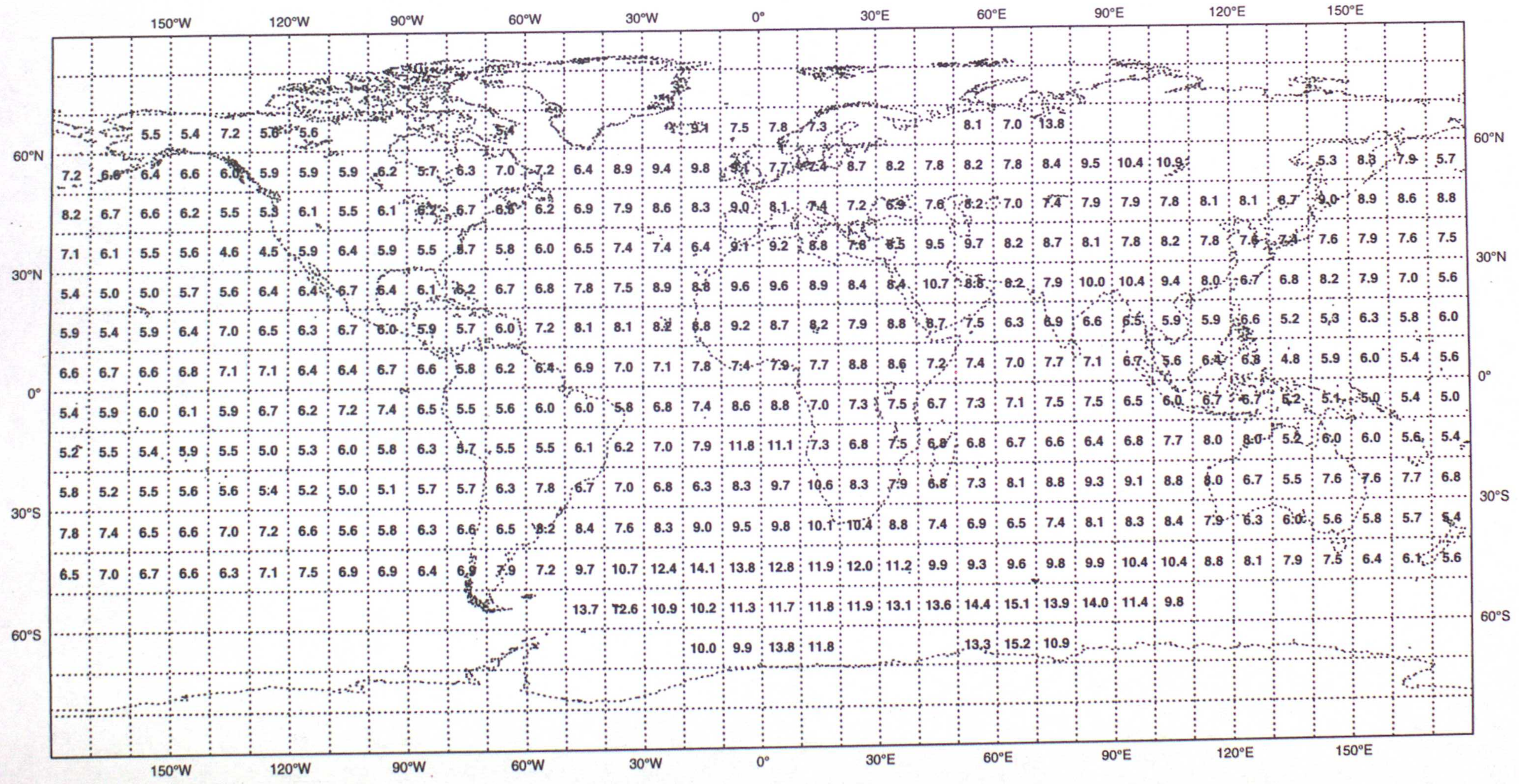

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-2.2 -2.1 -1.7 -3.0 -3.0 -2.0 -3.2 -1.2 -2.8 -2.5 -1.6 -2.1 -2.3
0.3 -1.6 -2.4 -1.4 -1.8 -2.2 -2.6 -2.5 -2.5 -1.5 -2.0 -1.2 -0.7 -0.2 -1.0 -0.6 -1.0 -2.0 -1.0 -0.4 -0.8 -0.8 -0.7 -1.5 -1.8 -1.6 -2.7 -3.2 -5.5 -1.1 -3.1 -1.3 0.7
-0.1 -0.3 -1.1 -0.8 -0.3 -0.6 -2.4 -2.0 -1.1 -0.8 -0.5 -0.1 -0.1 -0.3 0.2 0.4 0.1 -1.1 -1.3 -0.6 -1.2 -0.8 -1.8 -1.0 -0.4 -1.7 -1.4 -1.4 -2.3 -2.4 0.2 -1.8 -1.6 -2.3 -0.9 0.4
0.9 0.6 0.5 0.0 0.1 0.3 -0.7 -0.9 -0.1 -0.3 -0.1 -0.4 -0.2 -0.1 0.3 0.1 0.0 -2.1 -1.8 -1.3 -1.3 -2.1 -3.1 -2.7 -1.4 -2.0 -2.5 -1.7 -1.8 -0.6 1.2 0.5 0.2 0.5 0.7 0.7
0.1 0.5 0.1 0.5 -0.1 -0.7 -0.8 -1.8 1.3 -0.9 1.3 -2.0 -1.3 -0.4 0.1 0.0 -1.0 -1.9 -1.8 -1.3 -1.7 -2.0 -3.9 -1.9 -1.2 -0.5 -0.8 -1.9 -2.6 -1.1 1.6 1.6 2.0 1.9 1.2 0.0
1.0 0.6 -0.3 -1.1 -0.5 0.0 0.2 -0.7 -1.0 -0.1 0.1 -0.1 1.8 0.4 0.6 0.4 0.8 0.3 0.5 0.8 1.9 2.2 0.8 0.7 0.4 0.9 1.3 1.7 0.3 0.8 2.0 1.4 1.9 2.1 2.0 1.2
0.3 0.6 0.5 0.5 0.9 2.0 1.8 1.2 1.3 0.3 0.8 1.8 2.0 2.4 2.1 1.7 1.3 0.7 0.5 0.7 1.8 2.8 1.4 1.8 2.6 4.1 3.9 3.4 1.3 1.3 2.0 1.8 2.7 2.8 2.0 2.0
1.4 1.1 2.0 1.8 1.9 1.7 1.2 -0.3 2.2 0.7 0.8 1.7 1.8 1.6 1.7 1.5 1.2 0.1 2.1 1.5 1.8 1.6 1.5 2.2 2.9 3.2 3.1 2.5 1.5 1.5 2.1 1.8 1.6 2.1 2.4 1.9
1.0 0.2 0.1 0.6 0.4 0.4 0.3 -0.1 1.0 1.8 1.1 0.7 0.7 0.5 0.7 0.7 -0.4 3.4 2.7 1.3 0.3 0.3 0.7 1.1 1.4 1.0 1.0 0.5 0.2 0.8 1.6 1.5 0.7 0.1 0.5 0.8
0.0 0.3 -0.1 -0.5 0.0 0.4 0.0 0.5 -0.3 0.8 1.7 0.2 0.4 0.7 0.0 -0.2 -0.5 -0.3 -0.1 -1.3 -1.2 -0.5 -0.7 -0.3 -1.2 0.0 -0.8 -0.8 -2.2 -1.7 0.3 1.7 0.8 -1.4 0.7 0.5
-0.1 0.4 0.4 0.6 0.6 0.6 0.4 0.7 0.9 0.7 0.2 -0.4 0.3 -0.3 0.0 0.0 -0.9 -2.2 -2.2 -1.9 -2.1 -1.1 -0.7 -0.3 0.0 -0.2 -0.1 -0.3 -1.5 -2.1 0.1 0.0 0.2 0.2 -0.4 -0.3
-0.9 -1.1 -0.8 0.3 0.2 0.2 1.3 1.4 0.9 -0.7 -1.0 -0.8 0.1 -1.7 -2.0 -2.5 -4.0 -4.6 -3.7 -3.4 -3.6 -3.1 -2.6 -1.4 -1.3 -1.2 -1.5 -1.8 -1.9 -1.9 -2.4 -2.7 -2.3 -1.6 -1.4 -1.2
-6.7 -2.5 -2.2 -1.8 -2.0 -3.4 -4.4 -4.5 -5.5 -6.0 -5.2 -5.7 -5.3 -4.5 -3.2 -3.1
-1.3 -2.5 -2.0 -5.4 -4.1 -8.7 -3.0

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). APRIL 2004
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5.5 5.4 7.2 5.6 5.6 5.4 9.1 7.5 7.8 7.3 8.1 7.0 13.8
7.2 6.6 6.4 6.6 6.0 5.9 5.9 5.9 6.2 5.7 6.3 7.0 7.2 6.4 8.9 9.4 9.8 9.1 7.7 7.4 8.7 8.2 7.8 8.2 7.8 8.4 9.5 10.4 10.9 5.3 8.3 7.9 5.7
8.2 6.7 6.6 6.2 5.5 5.3 6.1 5.5 6.1 6.2 6.7 6.8 6.2 6.9 7.9 8.6 8.3 9.0 8.1 7.4 7.2 6.9 7.6 8.2 7.0 7.4 7.9 7.9 7.8 8.1 8.1 6.7 9.0 8.9 8.6 8.8
7.1 6.1 5.5 5.6 4.6 4.5 5.9 6.4 5.9 5.5 8.7 5.8 6.0 6.5 7.4 7.4 6.4 9.1 9.2 8.8 7.6 8.5 9.5 9.7 8.2 8.7 8.1 7.8 8.2 7.8 7.6 7.4 7.6 7.9 7.6 7.5
5.4 5.0 5.0 5.7 5.6 6.4 6.4 6.7 6.4 6.1 6.2 6.7 6.8 7.8 7.5 8.9 8.8 9.6 9.6 8.9 8.4 8.4 10.7 8.8 8.2 7.9 10.0 10.4 9.4 8.0 6.7 6.8 8.2 7.9 7.0 5.6
5.9 5.4 5.9 6.4 7.0 6.5 6.3 6.7 6.0 5.9 5.7 6.0 7.2 8.1 8.1 8.2 8.8 9.2 8.7 8.2 7.9 8.8 8.7 7.5 6.3 6.9 6.6 6.5 5.9 5.9 6.6 5.2 5.3 6.3 5.8 6.0
6.6 6.7 6.6 6.8 7.1 7.1 6.4 6.4 6.7 6.6 5.8 6.2 6.4 6.9 7.0 7.1 7.8 7.4 7.9 7.7 8.8 8.6 7.2 7.4 7.0 7.7 7.1 6.7 5.6 6.4 6.8 4.8 5.9 6.0 5.4 5.6
5.4 5.9 6.0 6.1 5.9 6.7 6.2 7.2 7.4 6.5 5.5 5.6 6.0 6.0 5.8 6.8 7.4 8.6 8.8 7.0 7.3 7.5 6.7 7.3 7.1 7.5 7.5 6.5 6.0 6.7 6.7 5.2 5.1 5.0 5.4 5.0
5.2 5.5 5.4 5.9 5.5 5.0 5.3 6.0 5.8 6.3 5.7 5.5 5.5 6.1 6.2 7.0 7.9 11.8 11.1 7.3 6.8 7.5 6.8 6.8 6.7 6.6 6.4 6.8 7.7 8.0 8.0 5.2 6.0 6.0 5.6 5.4
5.8 5.2 5.5 5.6 5.6 5.4 5.2 5.0 5.1 5.7 5.7 6.3 7.8 6.7 7.0 6.8 6.3 8.3 9.7 10.6 8.3 7.9 6.8 7.3 8.1 8.8 9.3 9.1 8.8 8.0 6.7 5.5 7.6 7.6 7.7 6.8
7.8 7.4 6.5 6.6 7.0 7.2 6.6 5.6 5.8 6.3 6.6 6.5 8.2 8.4 7.6 8.3 9.0 9.5 9.8 10.1 10.4 8.8 7.4 6.9 6.5 7.4 8.1 8.3 8.4 7.9 6.3 6.0 5.6 5.8 5.7 5.4
6.5 7.0 6.7 6.6 6.3 7.1 7.5 6.9 6.9 6.4 6.9 7.9 7.2 9.7 10.7 12.4 14.1 13.8 12.8 11.9 12.0 11.2 9.9 9.3 9.6 9.8 9.9 10.4 10.4 8.8 8.1 7.9 7.5 6.4 6.1 5.6
13.7 12.6 10.9 10.2 11.3 11.7 11.8 11.9 13.1 13.6 14.4 15.1 13.9 14.0 11.4 9.8
10.0 9.9 13.8 11.8 13.3 15.2 10.9

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: EXETER

MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15, NOAA-16 and NOAA-17.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. APRIL 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 648861

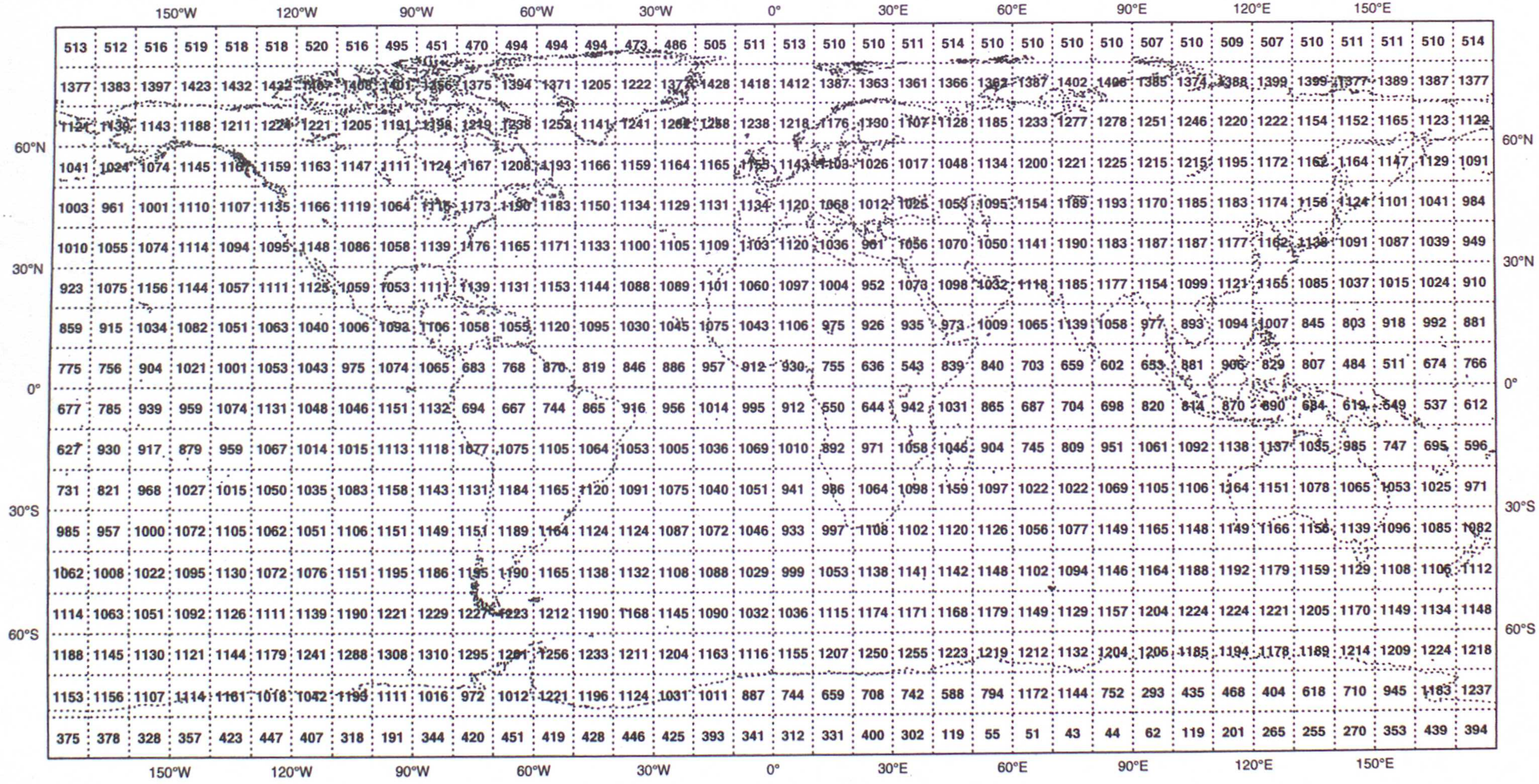
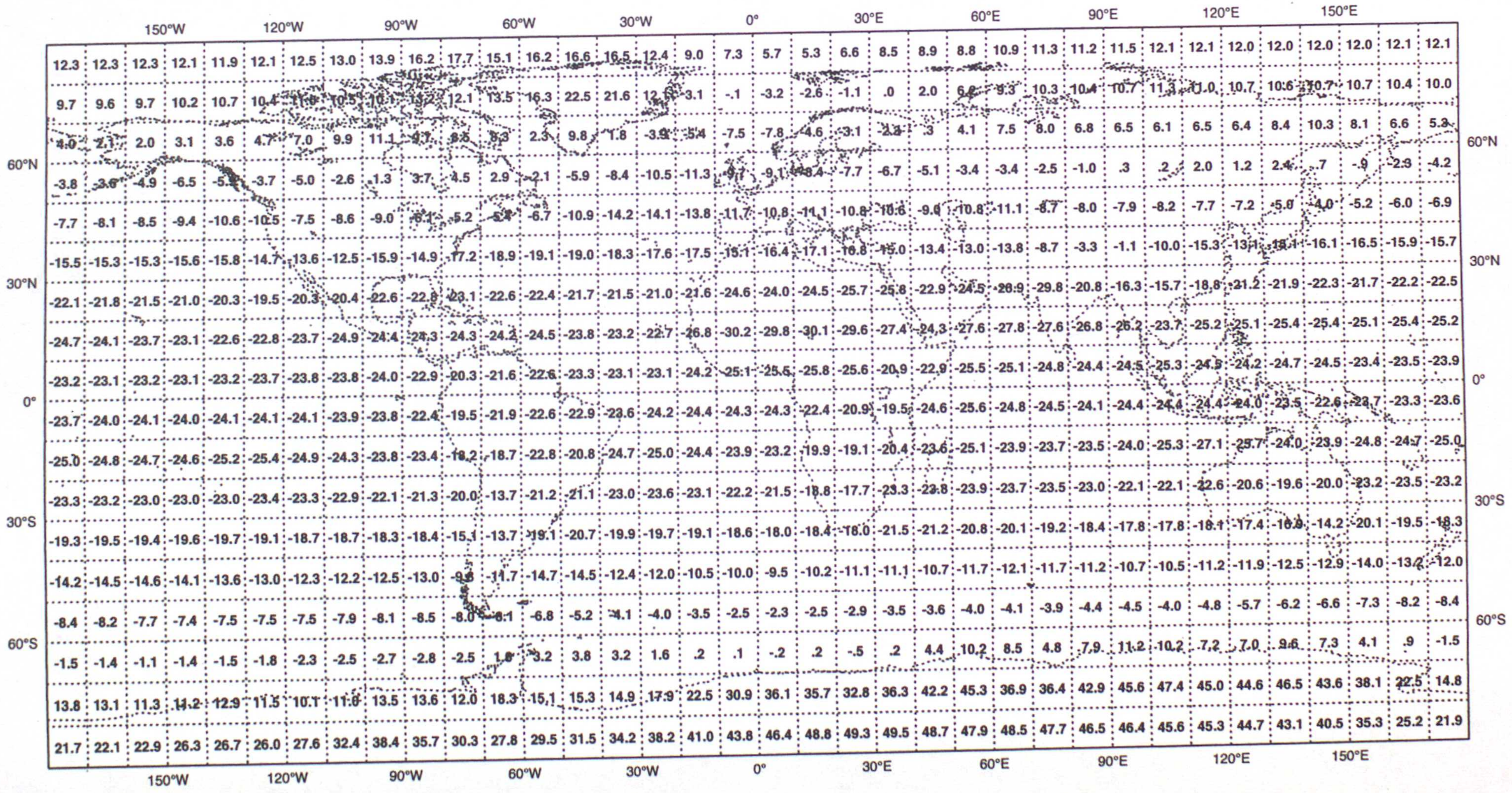

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
513 512 516 519 518 518 520 516 495 451 470 494 494 494 473 486 505 511 513 510 510 511 514 510 510 510 510 507 510 509 507 510 511 511 510 514
1377 1383 1397 1423 1432 1432 1407 1408 1401 1456 1375 1394 1371 1205 1222 1377 1428 1418 1412 1387 1363 1361 1366 1382 1387 1402 1406 1385 1374 1388 1399 1399 1377 1389 1387 1377
1124 1139 1143 1188 1211 1224 1221 1205 1191 1198 1219 1238 1252 1141 1241 1262 1258 1238 1218 1176 1130 1107 1128 1185 1233 1277 1278 1251 1246 1220 1222 1154 1152 1165 1123 1122
60°N
1041 1024 1074 1145 1167 1159 1163 1147 1111 1124 1167 1208 1193 1166 1159 1164 1165 1155 1143 1103 1026 1017 1048 1134 1200 1221 1225 1215 1215 1195 1172 1162 1164 1147 1129 1091
1003 961 1001 1110 1107 1135 1166 1119 1064 1116 1173 1190 1183 1150 1134 1129 1131 1134 1120 1068 1012 1025 1053 1095 1154 1189 1193 1170 1185 1183 1174 1158 1124 1101 1041 984
1010 1055 1074 1114 1094 1095 1148 1086 1058 1139 1176 1165 1171 1133 1100 1105 1109 1103 1120 1036 961 1056 1070 1050 1141 1190 1183 1187 1187 1177 1162 1138 1091 1087 1039 949
30°N
923 1075 1156 1144 1057 1111 1125 1059 1053 1111 1139 1131 1153 1144 1088 1089 1101 1060 1097 1004 952 1078 1098 1032 1118 1185 1177 1154 1099 1121 1155 1085 1037 1015 1024 910
859 915 1034 1082 1051 1063 1040 1006 1098 1106 1058 1055 1120 1095 1030 1045 1075 1043 1106 975 926 935 973 1009 1065 1139 1058 977 893 1094 1007 845 803 918 992 881
775 756 904 1021 1001 1053 1043 975 1074 1065 683 768 870 819 846 886 957 912 930 755 636 543 839 840 703 659 602 653 881 906 829 807 484 511 674 766
0°
677 785 939 959 1074 1131 1048 1046 1151 1132 694 667 744 865 916 956 1014 995 912 550 644 942 1031 865 687 704 698 820 814 870 890 684 619 549 537 612
627 930 917 879 959 1067 1014 1015 1113 1118 1077 1075 1105 1064 1053 1005 1036 1069 1010 892 971 1058 1046 904 745 809 951 1061 1092 1138 1137 1035 985 747 695 596
731 821 968 1027 1015 1050 1035 1083 1158 1143 1131 1184 1165 1120 1091 1075 1040 1051 941 986 1064 1098 1159 1097 1022 1022 1069 1105 1106 1164 1151 1078 1065 1053 1025 971
30°S
985 957 1000 1072 1105 1062 1051 1106 1151 1149 1151 1189 1164 1124 1124 1087 1072 1046 933 997 1108 1102 1120 1126 1056 1077 1149 1165 1148 1149 1166 1156 1139 1096 1085 1082
1062 1008 1022 1095 1130 1072 1076 1151 1195 1186 1195 1190 1165 1138 1132 1108 1088 1029 999 1053 1138 1141 1142 1148 1102 1094 1146 1164 1188 1192 1179 1159 1129 1108 1106 1112
1114 1063 1051 1092 1126 1111 1139 1190 1221 1229 1227 1223 1212 1190 1168 1145 1090 1032 1036 1115 1174 1171 1168 1179 1149 1129 1157 1204 1224 1224 1221 1205 1170 1149 1134 1148
60°S
1188 1145 1130 1121 1144 1179 1241 1288 1308 1310 1295 1291 1256 1233 1211 1204 1163 1116 1155 1207 1250 1255 1223 1219 1212 1132 1204 1205 1185 1194 1178 1189 1214 1209 1224 1218
1153 1156 1107 1114 1161 1018 1042 1193 1111 1016 972 1012 1221 1196 1124 1031 1011 887 744 659 708 742 588 794 1172 1144 752 293 435 468 404 618 710 945 1183 1237
375 378 328 357 423 447 407 318 191 344 420 451 419 428 446 425 393 341 312 331 400 302 119 55 51 43 44 62 119 201 265 255 270 353 439 394
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



12.3	12.3	12.3	12.1	11.9	12.1	12.5	13.0	13.9	16.2	17.7	15.1	16.2	16.6	16.5	12.4	9.0	7.3	5.7	5.3	6.6	8.5	8.9	8.8	10.9	11.3	11.2	11.5	12.1	12.1	12.0	12.0	12.0	12.0	12.1	12.1
9.7	9.6	9.7	10.2	10.7	10.4	11.0	10.5	10.1	13.2	12.1	13.5	16.3	22.5	21.6	12.5	3.1	-.1	-3.2	-2.6	-1.1	.0	2.0	6.6	9.3	10.3	10.4	10.7	11.3	11.0	10.7	10.6	10.7	10.7	10.4	10.0
4.0	2.1	2.0	3.1	3.6	4.7	7.0	9.9	11.1	9.7	8.5	8.3	2.3	9.8	1.8	-3.9	-5.4	-7.5	-7.8	-4.6	-3.1	-2.3	.3	4.1	7.5	8.0	6.8	6.5	6.1	6.5	6.4	8.4	10.3	8.1	6.6	5.3
-3.8	-3.6	-4.9	-6.5	-5.2	-3.7	-5.0	-2.6	-1.3	3.7	4.5	2.9	-2.1	-5.9	-8.4	-10.5	-11.3	-9.7	-9.1	-8.4	-7.7	-6.7	-5.1	-3.4	-3.4	-2.5	-1.0	.3	.2	2.0	1.2	2.4	.7	-.9	-2.3	-4.2
-7.7	-8.1	-8.5	-9.4	-10.6	-10.5	-7.5	-8.6	-9.0	-6.1	-5.2	-5.4	-6.7	-10.9	-14.2	-14.1	-13.8	-11.7	-10.8	-11.1	-10.8	-10.6	-9.0	-10.8	-11.1	-8.7	-8.0	-7.9	-8.2	-7.7	-7.2	-5.0	-4.0	-5.2	-6.0	-6.9
-15.5	-15.3	-15.3	-15.6	-15.8	-14.7	-13.6	-12.5	-15.9	-14.9	-17.2	-18.9	-19.1	-19.0	-18.3	-17.6	-17.5	-15.1	-16.4	-17.1	-16.8	-15.0	-13.4	-13.0	-13.8	-8.7	-3.3	-1.1	-10.0	-15.3	-13.1	-15.1	-16.1	-16.5	-15.9	-15.7
-22.1	-21.8	-21.5	-21.0	-20.3	-19.5	-20.3	-20.4	-22.6	-22.8	-23.1	-22.6	-22.4	-21.7	-21.5	-21.0	-21.6	-24.6	-24.0	-24.5	-25.7	-25.8	-22.9	-24.5	-28.9	-29.8	-20.8	-16.3	-15.7	-18.8	-21.2	-21.9	-22.3	-21.7	-22.2	-22.5
-24.7	-24.1	-23.7	-23.1	-22.6	-22.8	-23.7	-24.9	-24.4	-24.3	-24.3	-24.2	-24.5	-23.8	-23.2	-22.7	-26.8	-30.2	-29.8	-30.1	-29.6	-27.4	-24.3	-27.6	-27.8	-27.6	-26.8	-26.2	-23.7	-25.2	-25.1	-25.4	-25.4	-25.1	-25.4	-25.2
-23.2	-23.1	-23.2	-23.1	-23.2	-23.7	-23.8	-23.8	-24.0	-22.9	-20.3	-21.6	-22.6	-23.3	-23.1	-23.1	-24.2	-25.1	-25.5	-25.8	-25.6	-20.9	-22.9	-25.5	-25.1	-24.8	-24.4	-24.5	-25.3	-24.5	-24.2	-24.7	-24.5	-23.4	-23.5	-23.9
-23.7	-24.0	-24.1	-24.0	-24.1	-24.1	-24.1	-23.9	-23.8	-22.4	-19.5	-21.9	-22.6	-22.9	-23.6	-24.2	-24.4	-24.3	-24.3	-22.4	-20.9	-19.5	-24.6	-25.6	-24.8	-24.5	-24.1	-24.4	-24.4	-24.4	-24.0	-23.5	-22.6	-23.7	-23.3	-23.6
-25.0	-24.8	-24.7	-24.6	-25.2	-25.4	-24.9	-24.3	-23.8	-23.4	-18.2	-18.7	-22.8	-20.8	-24.7	-25.0	-24.4	-23.9	-23.2	-19.9	-19.1	-20.4	-23.6	-25.1	-23.9	-23.7	-23.5	-24.0	-25.3	-27.1	-25.7	-24.0	-23.9	-24.8	-24.7	-25.0
-23.3	-23.2	-23.0	-23.0	-23.0	-23.4	-23.3	-22.9	-22.1	-21.3	-20.0	-13.7	-21.2	-21.1	-23.0	-23.6	-23.1	-22.2	-21.5	-18.8	-17.7	-23.3	-23.8	-23.9	-23.7	-23.5	-23.0	-22.1	-22.1	-22.6	-20.6	-19.6	-20.0	-23.2	-23.5	-23.2
-19.3	-19.5	-19.4	-19.6	-19.7	-19.1	-18.7	-18.7	-18.3	-18.4	-15.1	-13.7	-19.1	-20.7	-19.9	-19.7	-19.1	-18.6	-18.0	-18.4	-18.0	-21.5	-21.2	-20.8	-20.1	-19.2	-18.4	-17.8	-17.8	-18.1	-17.4	-16.9	-14.2	-20.1	-19.5	-18.3
-14.2	-14.5	-14.6	-14.1	-13.6	-13.0	-12.3	-12.2	-12.5	-13.0	-9.8	-11.7	-14.7	-14.5	-12.4	-12.0	-10.5	-10.0	-9.5	-10.2	-11.1	-11.1	-10.7	-11.7	-12.1	-11.7	-11.2	-10.7	-10.5	-11.2	-11.9	-12.5	-12.9	-14.0	-13.2	-12.0
-8.4	-8.2	-7.7	-7.4	-7.5	-7.5	-7.5	-7.9	-8.1	-8.5	-8.0	-8.1	-6.8	-5.2	-4.1	-4.0	-3.5	-2.5	-2.3	-2.5	-2.9	-3.5	-3.6	-4.0	-4.1	-3.9	-4.4	-4.5	-4.0	-4.8	-5.7	-6.2	-6.6	-7.3	-8.2	-8.4
-1.5	-1.4	-1.1	-1.4	-1.5	-1.8	-2.3	-2.5	-2.7	-2.8	-2.5	1.8	3.2	3.8	3.2	1.6	.2	.1	-.2	.2	-.5	.2	4.4	10.2	8.5	4.8	7.9	11.2	-10.2	7.2	7.0	9.6	7.3	4.1	.9	-1.5
13.8	13.1	11.3	14.2	12.9	11.5	10.1	11.8	13.5	13.6	12.0	18.3	15.1	15.3	14.9	17.9	22.5	30.9	36.1	35.7	32.8	36.3	42.2	45.3	36.9	36.4	42.9	45.6	47.4	45.0	44.6	46.5	43.6	38.1	22.5	14.8
21.7	22.1	22.9	26.3	26.7	26.0	27.6	32.4	38.4	35.7	30.3	27.8	29.5	31.5	34.2	38.2	41.0	43.8	46.4	48.8	49.3	49.5	48.7	47.9	48.5	47.7	46.5	46.4	45.6	45.3	44.7	43.1	40.5	35.3	25.2	21.9

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations

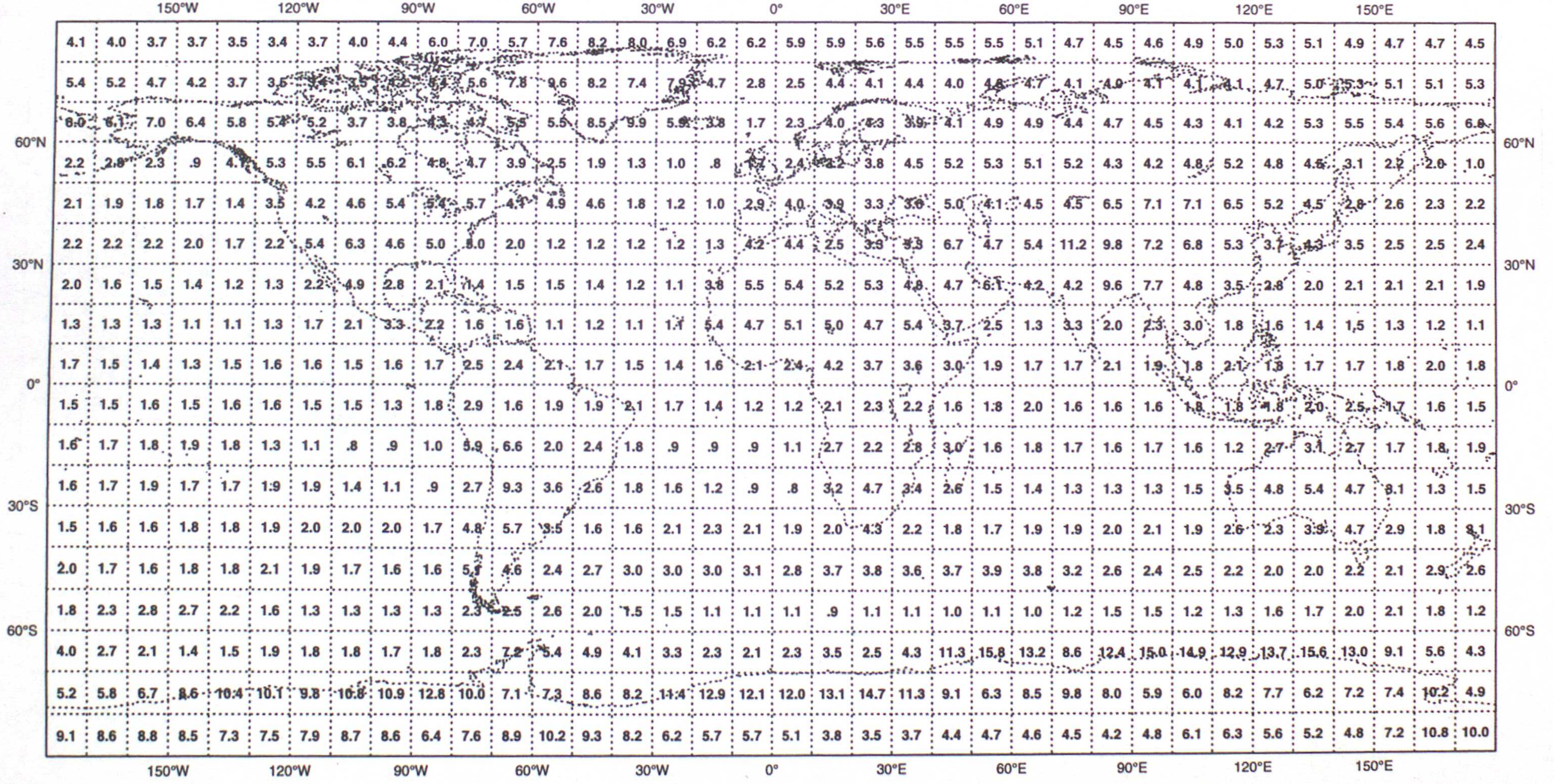
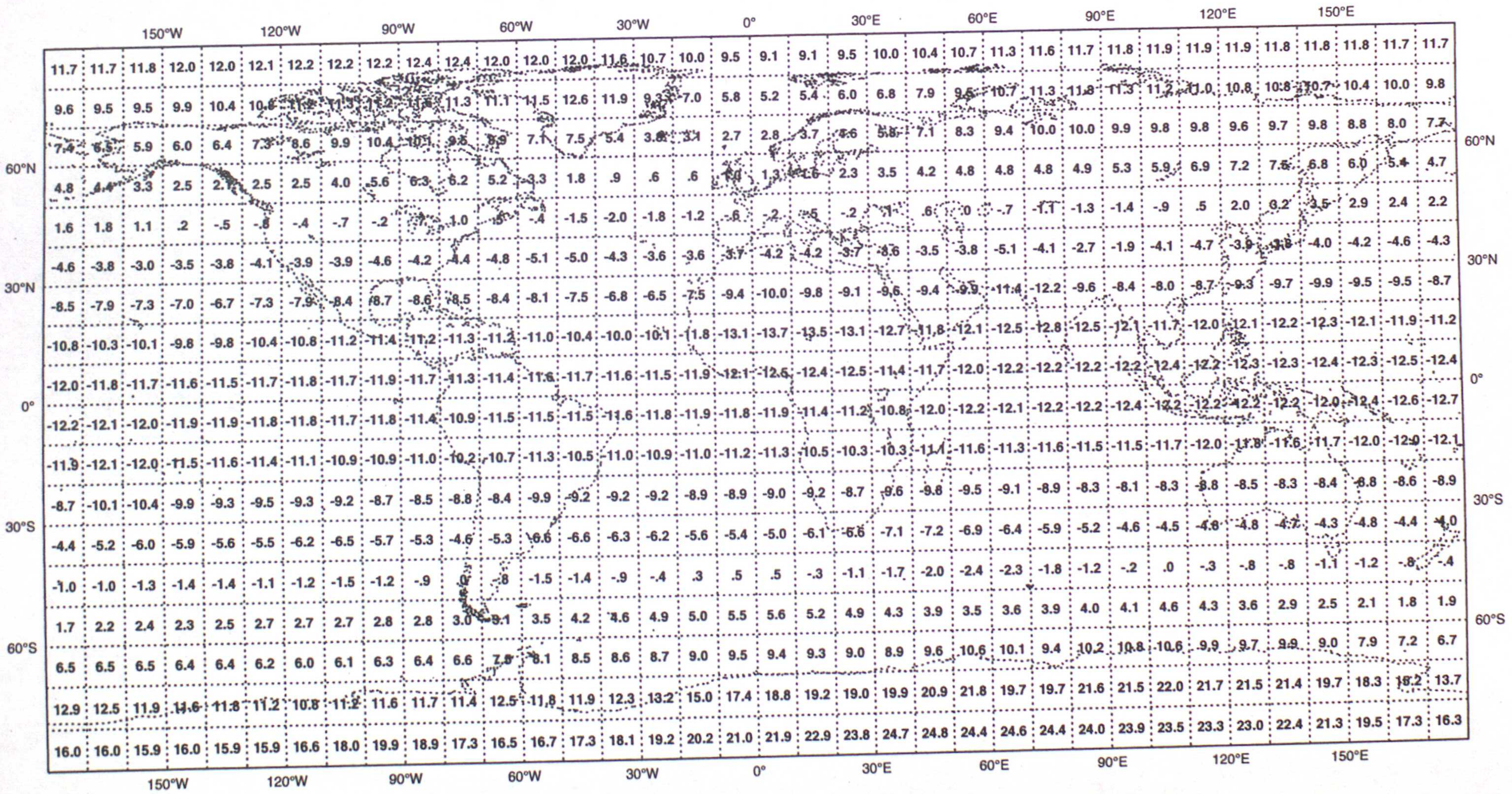

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
4.1 4.0 3.7 3.7 3.5 3.4 3.7 4.0 4.4 6.0 7.0 5.7 7.6 8.2 8.0 6.9 6.2 6.2 5.9 5.9 5.6 5.5 5.5 5.5 5.1 4.7 4.5 4.6 4.9 5.0 5.3 5.1 4.9 4.7 4.7 4.5
5.4 5.2 4.7 4.2 3.7 3.5 3.4 3.5 4.2 5.4 5.6 7.8 9.6 8.2 7.4 7.9 4.7 2.8 2.5 4.4 4.1 4.4 4.0 4.8 4.7 4.1 4.9 4.1 4.1 4.1 4.7 5.0 5.3 5.1 5.1 5.3
6.0 6.1 7.0 6.4 5.8 5.4 5.2 3.7 3.8 4.3 4.7 5.5 5.5 8.5 9.9 5.9 3.8 1.7 2.3 4.0 4.3 3.9 4.1 4.9 4.9 4.4 4.7 4.5 4.3 4.1 4.2 5.3 5.5 5.4 5.6 6.8
2.2 2.8 2.3 .9 4.1 5.3 5.5 6.1 6.2 4.8 4.7 3.9 2.5 1.9 1.3 1.0 .8 1.7 2.4 2.2 3.8 4.5 5.2 5.3 5.1 5.2 4.3 4.2 4.8 5.2 4.8 4.6 3.1 2.2 2.0 1.0
2.1 1.9 1.8 1.7 1.4 3.5 4.2 4.6 5.4 5.4 5.7 4.1 4.9 4.6 1.8 1.2 1.0 2.9 4.0 3.9 3.3 3.6 5.0 4.1 4.5 4.5 6.5 7.1 7.1 6.5 5.2 4.5 2.8 2.6 2.3 2.2
2.2 2.2 2.2 2.0 1.7 2.2 5.4 6.3 4.6 5.0 8.0 2.0 1.2 1.2 1.2 1.2 1.3 4.2 4.4 2.5 3.9 5.3 6.7 4.7 5.4 11.2 9.8 7.2 6.8 5.3 3.7 4.3 3.5 2.5 2.5 2.4
2.0 1.6 1.5 1.4 1.2 1.3 2.2 4.9 2.8 2.1 1.4 1.5 1.5 1.4 1.2 1.1 3.8 5.5 5.4 5.2 5.3 4.8 4.7 6.1 4.2 4.2 9.6 7.7 4.8 3.5 2.8 2.0 2.1 2.1 2.1 1.9
1.3 1.3 1.3 1.1 1.1 1.3 1.7 2.1 3.3 2.2 1.6 1.6 1.1 1.2 1.1 1.1 5.4 4.7 5.1 5.0 4.7 5.4 3.7 2.5 1.3 3.3 2.0 2.3 3.0 1.8 1.6 1.4 1.5 1.3 1.2 1.1
1.7 1.5 1.4 1.3 1.5 1.6 1.6 1.5 1.6 1.7 2.5 2.4 2.1 1.7 1.5 1.4 1.6 2.1 2.4 4.2 3.7 3.6 3.0 1.9 1.7 1.7 2.1 1.9 1.8 2.1 1.8 1.7 1.7 1.8 2.0 1.8
1.5 1.5 1.6 1.5 1.6 1.6 1.5 1.5 1.3 1.8 2.9 1.6 1.9 1.9 2.1 1.7 1.4 1.2 1.2 2.1 2.3 2.2 1.6 1.8 2.0 1.6 1.6 1.6 1.8 1.8 1.8 2.0 2.5 1.7 1.6 1.5
1.6 1.7 1.8 1.9 1.8 1.3 1.1 .8 .9 1.0 5.9 6.6 2.0 2.4 1.8 .9 .9 .9 1.1 2.7 2.2 2.8 3.0 1.6 1.8 1.7 1.6 1.7 1.6 1.2 2.7 3.1 2.7 1.7 1.8 1.9
1.6 1.7 1.9 1.7 1.7 1.9 1.9 1.4 1.1 .9 2.7 9.3 3.6 2.6 1.8 1.6 1.2 .9 .8 3.2 4.7 3.4 2.6 1.5 1.4 1.3 1.3 1.3 1.5 3.5 4.8 5.4 4.7 8.1 1.3 1.5
1.5 1.6 1.6 1.8 1.8 1.9 2.0 2.0 2.0 1.7 4.8 5.7 3.5 1.6 1.6 2.1 2.3 2.1 1.9 2.0 4.3 2.2 1.8 1.7 1.9 1.9 2.0 2.1 1.9 2.6 2.3 3.9 4.7 2.9 1.8 8.1
2.0 1.7 1.6 1.8 1.8 2.1 1.9 1.7 1.6 1.6 5.1 4.6 2.4 2.7 3.0 3.0 3.0 3.1 2.8 3.7 3.8 3.6 3.7 3.9 3.8 3.2 2.6 2.4 2.5 2.2 2.0 2.0 2.2 2.1 2.9 2.6
1.8 2.3 2.8 2.7 2.2 1.6 1.3 1.3 1.3 1.3 2.3 2.5 2.6 2.0 1.5 1.5 1.1 1.1 1.1 .9 1.1 1.1 1.0 1.1 1.0 1.2 1.5 1.5 1.2 1.3 1.6 1.7 2.0 2.1 1.8 1.2
4.0 2.7 2.1 1.4 1.5 1.9 1.8 1.8 1.7 1.8 2.3 7.2 5.4 4.9 4.1 3.3 2.3 2.1 2.3 3.5 2.5 4.3 11.3 15.8 13.2 8.6 12.4 15.0 14.9 12.9 13.7 15.6 13.0 9.1 5.6 4.3
5.2 5.8 6.7 8.6 10.4 10.1 9.8 10.8 10.9 12.8 10.0 7.1 7.3 8.6 8.2 11.4 12.9 12.1 12.0 13.1 14.7 11.3 9.1 6.3 8.5 9.8 8.0 5.9 6.0 8.2 7.7 6.2 7.2 7.4 10.2 4.9
9.1 8.6 8.8 8.5 7.3 7.5 7.9 8.7 8.6 6.4 7.6 8.9 10.2 9.3 8.2 6.2 5.7 5.7 5.1 3.8 3.5 3.7 4.4 4.7 4.6 4.5 4.2 4.8 6.1 6.3 5.6 5.2 4.8 7.2 10.8 10.0

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



11.7	11.7	11.8	12.0	12.0	12.1	12.2	12.2	12.2	12.4	12.4	12.0	12.0	12.0	11.6	10.7	10.0	9.5	9.1	9.1	9.5	10.0	10.4	10.7	11.3	11.6	11.7	11.8	11.9	11.9	11.9	11.8	11.8	11.8	11.7	11.7
9.6	9.5	9.5	9.9	10.4	10.6	11.2	11.3	11.2	11.6	11.3	11.1	11.5	12.6	11.9	9.3	7.0	5.8	5.2	5.4	6.0	6.8	7.9	9.5	10.7	11.3	11.8	11.3	11.2	11.0	10.8	10.8	10.7	10.4	10.0	9.8
7.4	6.5	5.9	6.0	6.4	7.3	8.6	9.9	10.4	10.1	9.5	8.9	7.1	7.5	5.4	3.8	3.1	2.7	2.8	3.7	4.6	5.8	7.1	8.3	9.4	10.0	10.0	9.9	9.8	9.8	9.6	9.7	9.8	8.8	8.0	7.7
4.8	4.4	3.3	2.5	2.1	2.5	2.5	4.0	5.6	6.3	6.2	5.2	3.3	1.8	.9	.6	.6	1.0	1.3	1.6	2.3	3.5	4.2	4.8	4.8	4.8	4.9	5.3	5.9	6.9	7.2	7.5	6.8	6.0	5.4	4.7
1.6	1.8	1.1	.2	-.5	-.8	-.4	-.7	-.2	.7	1.0	.5	-.4	-1.5	-2.0	-1.8	-1.2	-.6	-.2	-.5	-.2	.1	.6	.0	-.7	-1.1	-1.3	-1.4	-.9	.5	2.0	3.2	3.5	2.9	2.4	2.2
-4.6	-3.8	-3.0	-3.5	-3.8	-4.1	-3.9	-3.9	-4.6	-4.2	-4.4	-4.8	-5.1	-5.0	-4.3	-3.6	-3.6	-3.7	-4.2	-4.2	-3.7	-3.6	-3.5	-3.8	-5.1	-4.1	-2.7	-1.9	-4.1	-4.7	-3.9	-3.8	-4.0	-4.2	-4.6	-4.3
-8.5	-7.9	-7.3	-7.0	-6.7	-7.3	-7.9	-8.4	-8.7	-8.6	-8.5	-8.4	-8.1	-7.5	-6.8	-6.5	-7.5	-9.4	-10.0	-9.8	-9.1	-9.6	-9.4	-9.9	-11.4	-12.2	-9.6	-8.4	-8.0	-8.7	-9.3	-9.7	-9.9	-9.5	-9.5	-8.7
-10.8	-10.3	-10.1	-9.8	-9.8	-10.4	-10.8	-11.2	-11.4	-11.2	-11.3	-11.2	-11.0	-10.4	-10.0	-10.1	-11.8	-13.1	-13.7	-13.5	-13.1	-12.7	-11.8	-12.1	-12.5	-12.8	-12.5	-12.1	-11.7	-12.0	-12.1	-12.2	-12.3	-12.1	-11.9	-11.2
-12.0	-11.8	-11.7	-11.6	-11.5	-11.7	-11.8	-11.7	-11.9	-11.7	-11.3	-11.4	-11.6	-11.7	-11.6	-11.5	-11.9	-12.1	-12.6	-12.4	-12.5	-11.4	-11.7	-12.0	-12.2	-12.2	-12.2	-12.2	-12.4	-12.2	-12.3	-12.3	-12.4	-12.3	-12.5	-12.4
-12.2	-12.1	-12.0	-11.9	-11.9	-11.8	-11.8	-11.7	-11.8	-11.4	-10.9	-11.5	-11.5	-11.5	-11.6	-11.8	-11.9	-11.8	-11.9	-11.4	-11.2	-10.8	-12.0	-12.2	-12.1	-12.2	-12.2	-12.4	-12.2	-12.2	-12.2	-12.2	-12.0	-12.4	-12.6	-12.7
-11.9	-12.1	-12.0	-11.5	-11.6	-11.4	-11.1	-10.9	-10.9	-11.0	-10.2	-10.7	-11.3	-10.5	-11.0	-10.9	-11.0	-11.2	-11.3	-10.5	-10.3	-10.3	-11.1	-11.6	-11.3	-11.6	-11.5	-11.5	-11.7	-12.0	-11.8	-11.6	-11.7	-12.0	-12.0	-12.1
-8.7	-10.1	-10.4	-9.9	-9.3	-9.5	-9.3	-9.2	-8.7	-8.5	-8.8	-8.4	-9.9	-9.2	-9.2	-9.2	-8.9	-8.9	-9.0	-9.2	-8.7	-9.6	-9.8	-9.5	-9.1	-8.9	-8.3	-8.1	-8.3	-8.8	-8.5	-8.3	-8.4	-8.8	-8.6	-8.9
-4.4	-5.2	-6.0	-5.9	-5.6	-5.5	-6.2	-6.5	-5.7	-5.3	-4.6	-5.3	-6.6	-6.6	-6.3	-6.2	-5.6	-5.4	-5.0	-6.1	-6.6	-7.1	-7.2	-6.9	-6.4	-5.9	-5.2	-4.6	-4.5	-4.8	-4.8	-4.7	-4.3	-4.8	-4.4	-4.0
-1.0	-1.0	-1.3	-1.4	-1.4	-1.1	-1.2	-1.5	-1.2	-.9	.0	-.8	-1.5	-1.4	-.9	-.4	.3	.5	.5	-.3	-1.1	-1.7	-2.0	-2.4	-2.3	-1.8	-1.2	-.2	.0	-.3	-.8	-.8	-1.1	-1.2	-.8	-.4
1.7	2.2	2.4	2.3	2.5	2.7	2.7	2.7	2.8	2.8	3.0	3.1	3.5	4.2	4.6	4.9	5.0	5.5	5.6	5.2	4.9	4.3	3.9	3.5	3.6	3.9	4.0	4.1	4.6	4.3	3.6	2.9	2.5	2.1	1.8	1.9
6.5	6.5	6.5	6.4	6.4	6.2	6.0	6.1	6.3	6.4	6.6	7.8	8.1	8.5	8.6	8.7	9.0	9.5	9.4	9.3	9.0	8.9	9.6	10.6	10.1	9.4	10.2	10.8	10.6	9.9	9.7	9.9	9.0	7.9	7.2	6.7
12.9	12.5	11.9	11.6	11.8	11.2	10.8	11.2	11.6	11.7	11.4	12.5	11.8	11.9	12.3	13.2	15.0	17.4	18.8	19.2	19.0	19.9	20.9	21.8	19.7	19.7	21.6	21.5	22.0	21.7	21.5	21.4	19.7	18.3	18.2	13.7
16.0	16.0	15.9	16.0	15.9	15.9	16.6	18.0	19.9	18.9	17.3	16.5	16.7	17.3	18.1	19.2	20.2	21.0	21.9	22.9	23.8	24.7	24.8	24.4	24.6	24.4	24.0	23.9	23.5	23.3	23.0	22.4	21.3	19.5	17.3	16.3

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

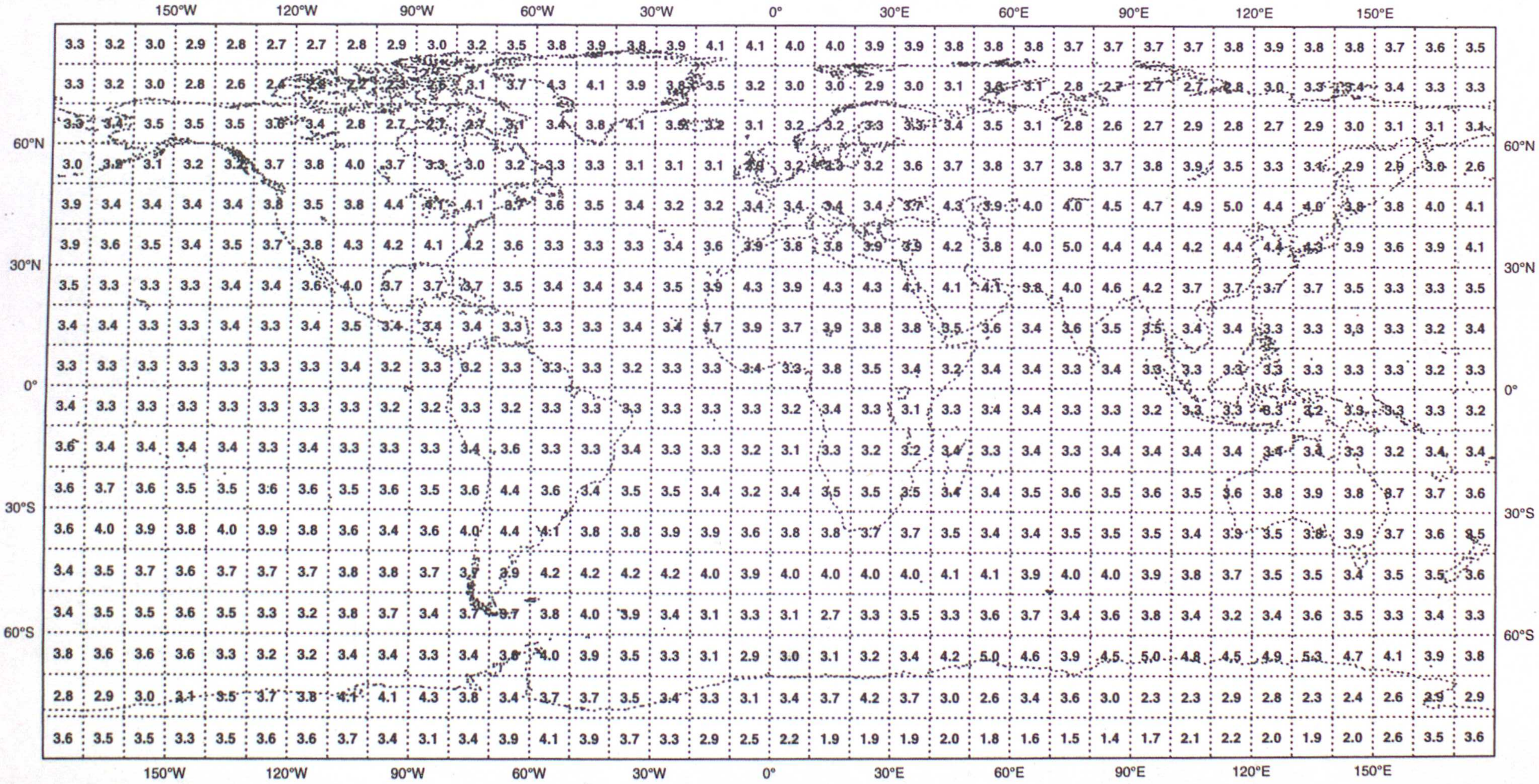
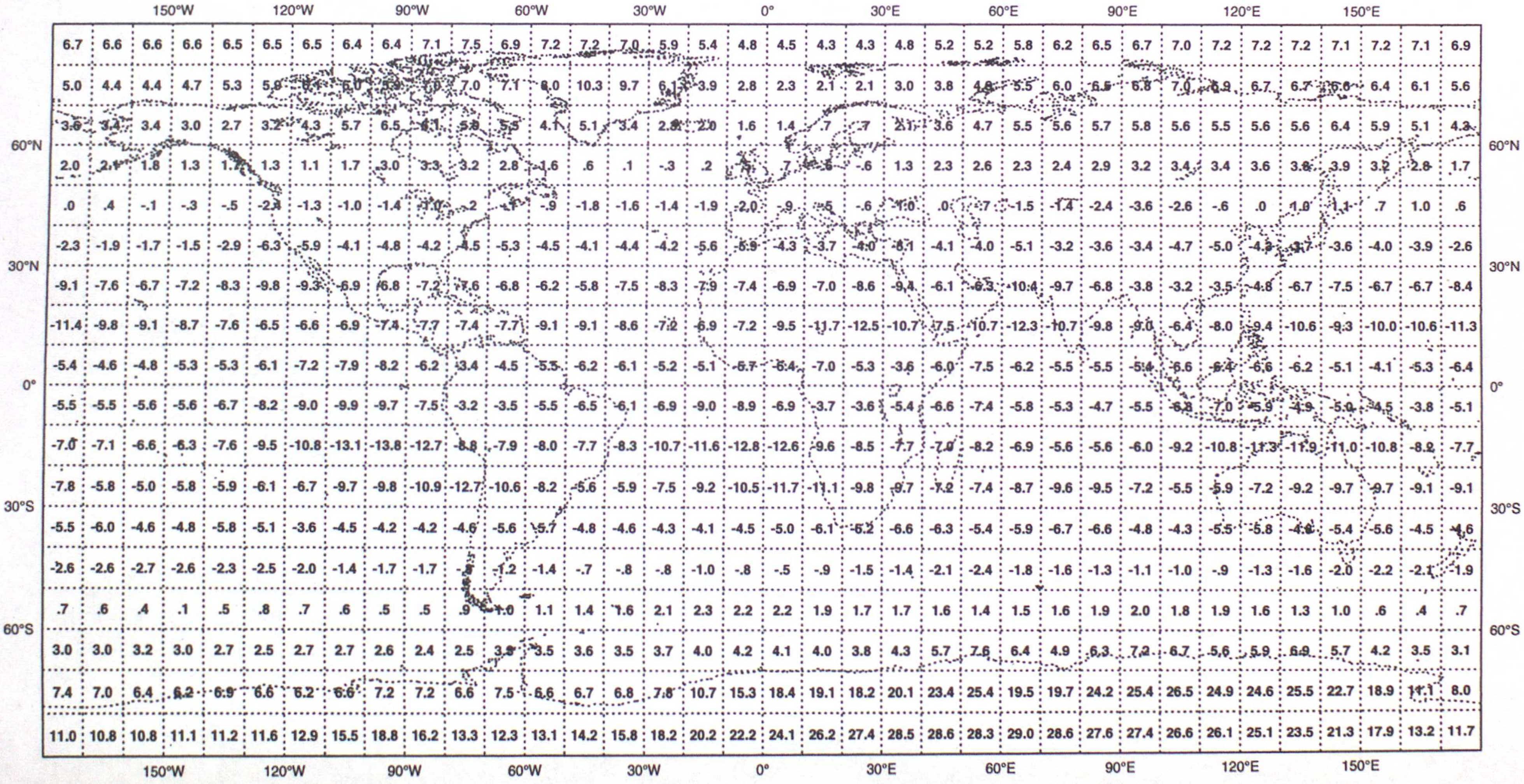

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



6.7	6.6	6.6	6.6	6.5	6.5	6.5	6.4	6.4	7.1	7.5	6.9	7.2	7.2	7.0	5.9	5.4	4.8	4.5	4.3	4.3	4.8	5.2	5.2	5.8	6.2	6.5	6.7	7.0	7.2	7.2	7.2	7.1	7.2	7.1	6.9
5.0	4.4	4.4	4.7	5.3	5.8	6.1	6.0	5.9	7.0	7.0	7.1	8.0	10.3	9.7	6.1	3.9	2.8	2.3	2.1	2.1	3.0	3.8	4.8	5.5	6.0	6.5	6.8	7.0	6.9	6.7	6.7	6.6	6.4	6.1	5.6
3.6	3.4	3.4	3.0	2.7	3.2	4.3	5.7	6.5	6.1	5.8	5.5	4.1	5.1	3.4	2.8	2.0	1.6	1.4	.7	.7	2.1	3.6	4.7	5.5	5.6	5.7	5.8	5.6	5.5	5.6	5.6	6.4	5.9	5.1	4.3
2.0	2.1	1.8	1.3	1.7	1.3	1.1	1.7	3.0	3.3	3.2	2.8	-1.6	.6	.1	-.3	.2	.5	.7	-.6	-.6	1.3	2.3	2.6	2.3	2.4	2.9	3.2	3.4	3.4	3.6	3.8	3.9	3.2	2.8	1.7
.0	.4	-.1	-.3	-.5	-2.4	-1.3	-1.0	-1.4	-1.0	-.2	-.1	-.9	-1.8	-1.6	-1.4	-1.9	-2.0	-.9	-.5	-.6	-1.0	.0	-.7	-1.5	-1.4	-2.4	-3.6	-2.6	-.6	.0	1.0	1.1	.7	1.0	.6
-2.3	-1.9	-1.7	-1.5	-2.9	-6.3	-5.9	-4.1	-4.8	-4.2	-4.5	-5.3	-4.5	-4.1	-4.4	-4.2	-5.6	-5.9	-4.3	-3.7	-4.0	-6.1	-4.1	-4.0	-5.1	-3.2	-3.6	-3.4	-4.7	-5.0	-4.3	-3.7	-3.6	-4.0	-3.9	-2.6
-9.1	-7.6	-6.7	-7.2	-8.3	-9.8	-9.3	-6.9	-6.8	-7.2	-7.6	-6.8	-6.2	-5.8	-7.5	-8.3	-7.9	-7.4	-6.9	-7.0	-8.6	-9.4	-6.1	-6.3	-10.4	-9.7	-6.8	-3.8	-3.2	-3.5	-4.8	-6.7	-7.5	-6.7	-6.7	-8.4
-11.4	-9.8	-9.1	-8.7	-7.6	-6.5	-6.6	-6.9	-7.4	-7.7	-7.4	-7.7	-9.1	-9.1	-8.6	-7.2	-6.9	-7.2	-9.5	-11.7	-12.5	-10.7	-7.5	-10.7	-12.3	-10.7	-9.8	-9.0	-6.4	-8.0	-9.4	-10.6	-9.3	-10.0	-10.6	-11.3
-5.4	-4.6	-4.8	-5.3	-5.3	-6.1	-7.2	-7.9	-8.2	-6.2	-3.4	-4.5	-5.5	-6.2	-6.1	-5.2	-5.1	-6.7	-6.4	-7.0	-5.3	-3.6	-6.0	-7.5	-6.2	-5.5	-5.5	-5.4	-6.6	-6.4	-6.6	-6.2	-5.1	-4.1	-5.3	-6.4
-5.5	-5.5	-5.6	-5.6	-6.7	-8.2	-9.0	-9.9	-9.7	-7.5	-3.2	-3.5	-5.5	-6.5	-6.1	-6.9	-9.0	-8.9	-6.9	-3.7	-3.6	-5.4	-6.6	-7.4	-5.8	-5.3	-4.7	-5.5	-6.8	-7.0	-5.9	-4.9	-5.0	-4.5	-3.8	-5.1
-7.0	-7.1	-6.6	-6.3	-7.6	-9.5	-10.8	-13.1	-13.8	-12.7	-8.8	-7.9	-8.0	-7.7	-8.3	-10.7	-11.6	-12.8	-12.6	-9.6	-8.5	-7.7	-7.0	-8.2	-6.9	-5.6	-5.6	-6.0	-9.2	-10.8	-11.3	-11.9	-11.0	-10.8	-8.2	-7.7
-7.8	-5.8	-5.0	-5.8	-5.9	-6.1	-6.7	-9.7	-9.8	-10.9	-12.7	-10.6	-8.2	-5.6	-5.9	-7.5	-9.2	-10.5	-11.7	-11.1	-9.8	-9.7	-7.2	-7.4	-8.7	-9.6	-9.5	-7.2	-5.5	-5.9	-7.2	-9.2	-9.7	-9.7	-9.1	-9.1
-5.5	-6.0	-4.6	-4.8	-5.8	-5.1	-3.6	-4.5	-4.2	-4.2	-4.6	-5.6	-5.7	-4.8	-4.6	-4.3	-4.1	-4.5	-5.0	-6.1	-6.2	-6.6	-6.3	-5.4	-5.9	-6.7	-6.6	-4.8	-4.3	-5.5	-5.8	-4.6	-5.4	-5.6	-4.5	-4.6
-2.6	-2.6	-2.7	-2.6	-2.3	-2.5	-2.0	-1.4	-1.7	-1.7	-.8	-1.2	-1.4	-.7	-.8	-.8	-1.0	-.8	-.5	-.9	-1.5	-1.4	-2.1	-2.4	-1.8	-1.6	-1.3	-1.1	-1.0	-.9	-1.3	-1.6	-2.0	-2.2	-2.1	-1.9
.7	.6	.4	.1	.5	.8	.7	.6	.5	.5	.9	1.0	1.1	1.4	1.6	2.1	2.3	2.2	2.2	1.9	1.7	1.7	1.6	1.4	1.5	1.6	1.9	2.0	1.8	1.9	1.6	1.3	1.0	.6	.4	.7
3.0	3.0	3.2	3.0	2.7	2.5	2.7	2.7	2.6	2.4	2.5	3.8	3.5	3.6	3.5	3.7	4.0	4.2	4.1	4.0	3.8	4.3	5.7	7.6	6.4	4.9	6.3	7.2	6.7	5.6	5.9	6.9	5.7	4.2	3.5	3.1
7.4	7.0	6.4	6.2	6.9	6.6	6.2	6.6	7.2	7.2	6.6	7.5	6.6	6.7	6.8	7.8	10.7	15.3	18.4	19.1	18.2	20.1	23.4	25.4	19.5	19.7	24.2	25.4	26.5	24.9	24.6	25.5	22.7	18.9	11.1	8.0
11.0	10.8	10.8	11.1	11.2	11.6	12.9	15.5	18.8	16.2	13.3	12.3	13.1	14.2	15.8	18.2	20.2	22.2	24.1	26.2	27.4	28.5	28.6	28.3	29.0	28.6	27.6	27.4	26.6	26.1	25.1	23.5	21.3	17.9	13.2	11.7

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

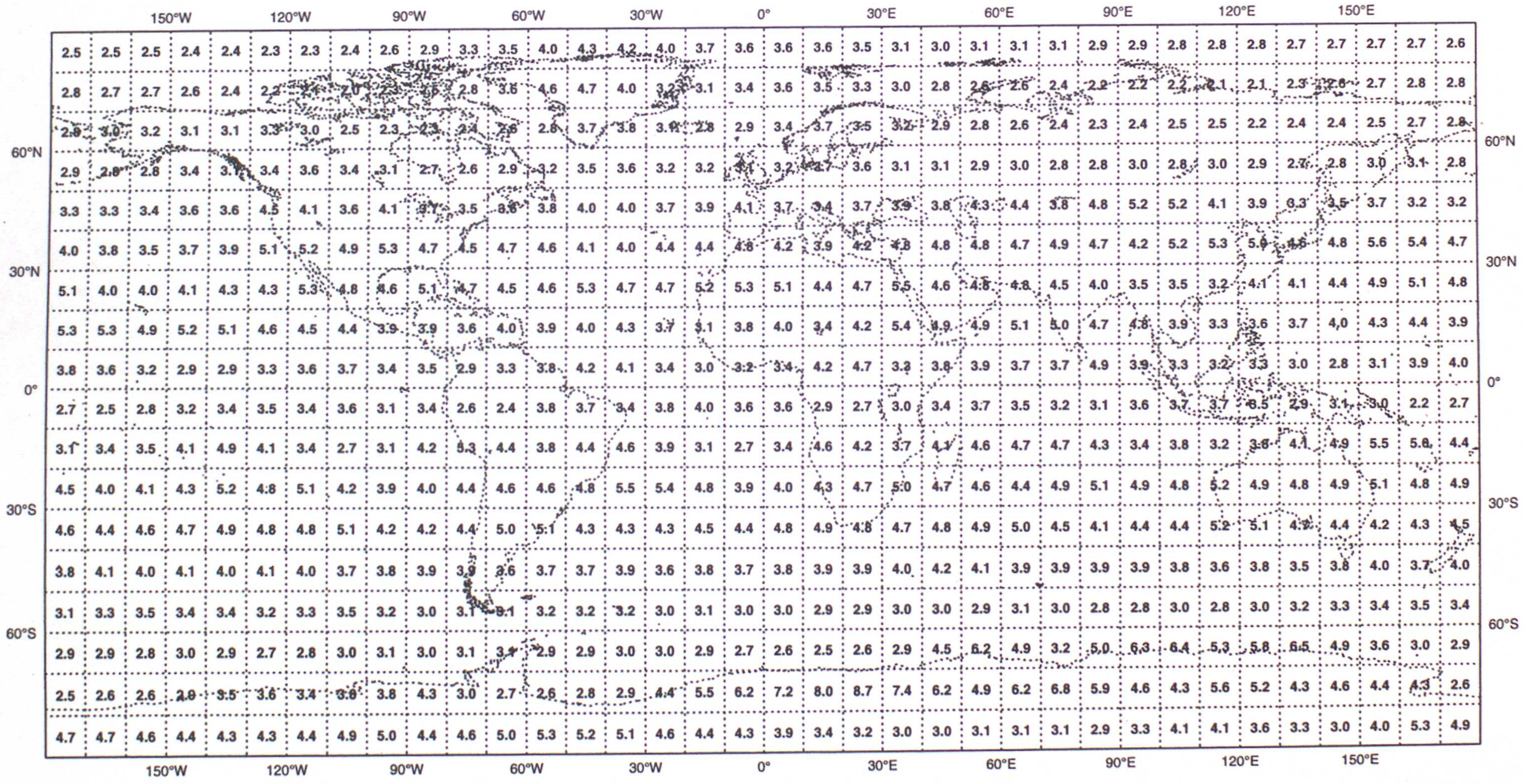
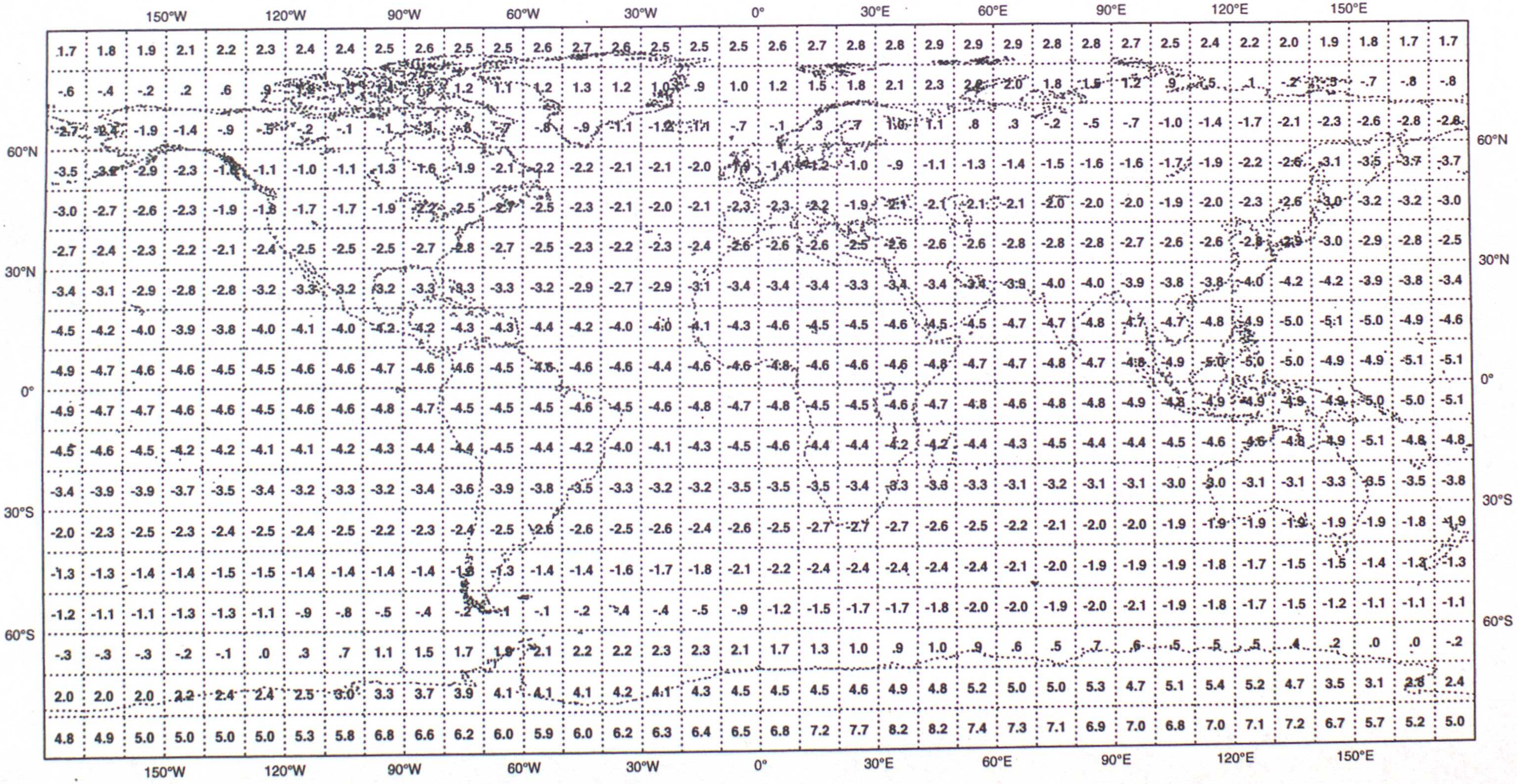
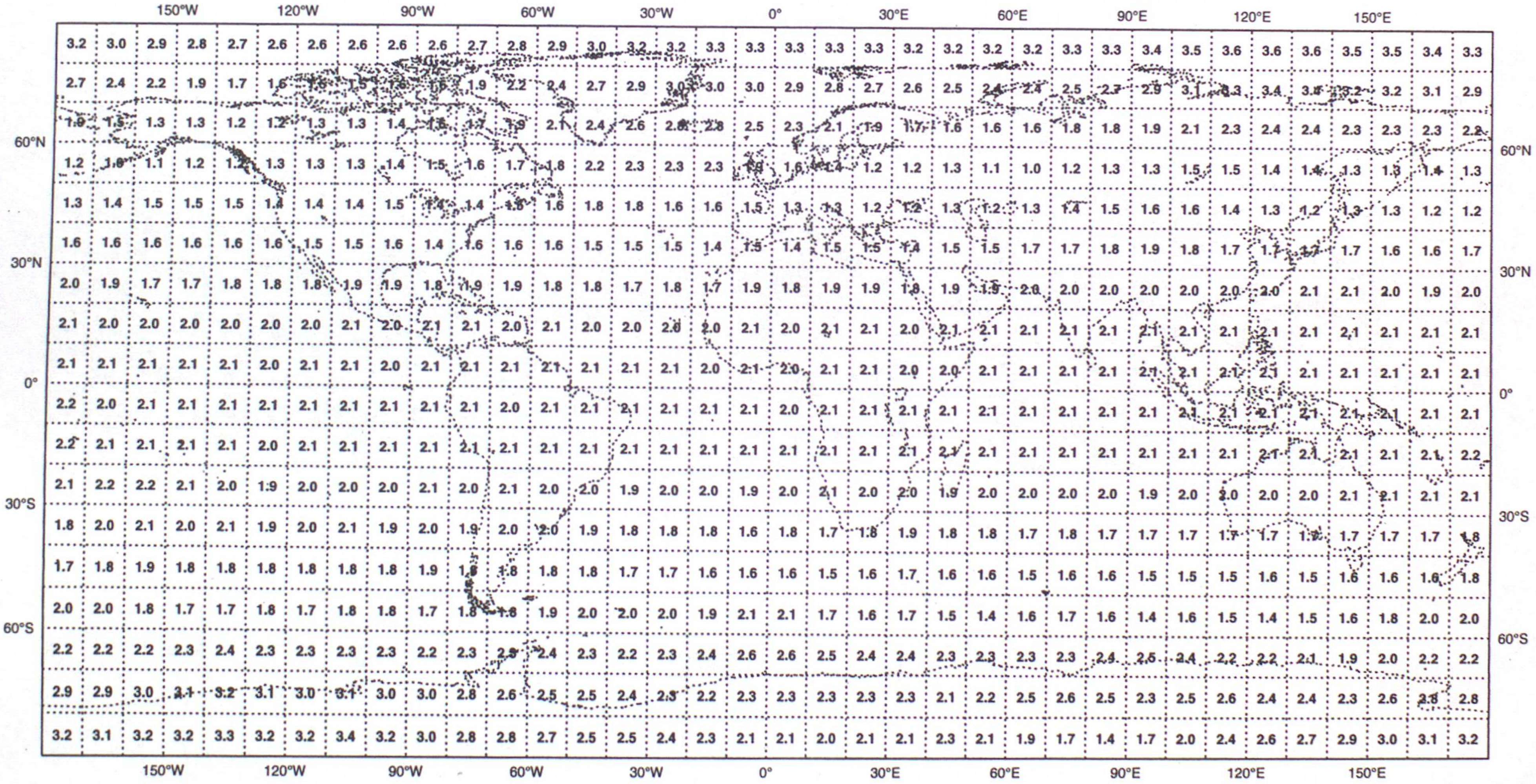

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
2.5 2.5 2.5 2.4 2.4 2.3 2.3 2.4 2.6 2.9 3.3 3.5 4.0 4.3 4.2 4.0 3.7 3.6 3.6 3.6 3.5 3.1 3.0 3.1 3.1 3.1 2.9 2.9 2.8 2.8 2.8 2.7 2.7 2.7 2.7 2.6
2.8 2.7 2.7 2.6 2.4 2.2 2.1 2.0 2.3 2.5 2.8 3.6 4.6 4.7 4.0 3.2 3.1 3.4 3.6 3.5 3.3 3.0 2.8 2.6 2.6 2.4 2.2 2.2 2.2 2.1 2.1 2.3 2.6 2.7 2.8 2.8
2.8 3.0 3.2 3.1 3.1 3.3 3.0 2.5 2.3 2.3 2.4 2.6 2.8 3.7 3.8 3.1 2.8 2.9 3.4 3.7 3.5 3.2 2.9 2.8 2.6 2.4 2.3 2.4 2.5 2.5 2.2 2.4 2.4 2.5 2.7 2.8
2.9 2.8 2.8 3.4 3.1 3.4 3.6 3.4 3.1 2.7 2.6 2.9 3.2 3.5 3.6 3.2 3.2 3.1 3.2 3.7 3.6 3.1 3.1 2.9 3.0 2.8 2.8 3.0 2.8 3.0 2.9 2.7 2.8 3.0 3.1 2.8
3.3 3.3 3.4 3.6 3.6 4.5 4.1 3.6 4.1 3.7 3.5 3.6 3.8 4.0 4.0 3.7 3.9 4.1 3.7 3.4 3.7 3.9 3.8 4.3 4.4 3.8 4.8 5.2 5.2 4.1 3.9 6.3 3.5 3.7 3.2 3.2
4.0 3.8 3.5 3.7 3.9 5.1 5.2 4.9 5.3 4.7 4.5 4.7 4.6 4.1 4.0 4.4 4.4 4.8 4.2 3.9 4.2 4.3 4.8 4.8 4.7 4.9 4.7 4.2 5.2 5.3 5.0 4.6 4.8 5.6 5.4 4.7
5.1 4.0 4.0 4.1 4.3 4.3 5.3 4.8 4.6 5.1 4.7 4.5 4.6 5.3 4.7 4.7 5.2 5.3 5.1 4.4 4.7 5.5 4.6 4.8 4.8 4.5 4.0 3.5 3.5 3.2 4.1 4.1 4.4 4.9 5.1 4.8
5.3 5.3 4.9 5.2 5.1 4.6 4.5 4.4 3.9 3.9 3.6 4.0 3.9 4.0 4.3 3.7 3.1 3.8 4.0 3.4 4.2 5.4 4.9 4.9 5.1 5.0 4.7 4.8 3.9 3.3 3.6 3.7 4.0 4.3 4.4 3.9
3.8 3.6 3.2 2.9 2.9 3.3 3.6 3.7 3.4 3.5 2.9 3.3 3.8 4.2 4.1 3.4 3.0 3.2 3.4 4.2 4.7 3.3 3.8 3.9 3.7 3.7 4.9 3.9 3.3 3.2 3.3 3.0 2.8 3.1 3.9 4.0
2.7 2.5 2.8 3.2 3.4 3.5 3.4 3.6 3.1 3.4 2.6 2.4 3.8 3.7 3.4 3.8 4.0 3.6 3.6 2.9 2.7 3.0 3.4 3.7 3.5 3.2 3.1 3.6 3.7 3.7 6.5 2.9 3.1 3.0 2.2 2.7
3.1 3.4 3.5 4.1 4.9 4.1 3.4 2.7 3.1 4.2 5.3 4.4 3.8 4.4 4.6 3.9 3.1 2.7 3.4 4.6 4.2 3.7 4.1 4.6 4.7 4.7 4.3 3.4 3.8 3.2 3.8 4.1 4.9 5.5 5.8 4.4
4.5 4.0 4.1 4.3 5.2 4.8 5.1 4.2 3.9 4.0 4.4 4.6 4.6 4.8 5.5 5.4 4.8 3.9 4.0 4.3 4.7 5.0 4.7 4.6 4.4 4.9 5.1 4.9 4.8 5.2 4.9 4.8 4.9 5.1 4.8 4.9
4.6 4.4 4.6 4.7 4.9 4.8 4.8 5.1 4.2 4.2 4.4 5.0 5.1 4.3 4.3 4.3 4.5 4.4 4.8 4.9 4.8 4.7 4.8 4.9 5.0 4.5 4.1 4.4 4.4 5.2 5.1 4.2 4.4 4.2 4.3 4.5
3.8 4.1 4.0 4.1 4.0 4.1 4.0 3.7 3.8 3.9 3.9 3.6 3.7 3.7 3.9 3.6 3.8 3.7 3.8 3.9 3.9 4.0 4.2 4.1 3.9 3.9 3.9 3.9 3.8 3.6 3.8 3.5 3.8 4.0 3.7 4.0
3.1 3.3 3.5 3.4 3.4 3.2 3.3 3.5 3.2 3.0 3.1 3.1 3.2 3.2 3.2 3.0 3.1 3.0 3.0 2.9 2.9 3.0 3.0 2.9 3.1 3.0 2.8 2.8 3.0 2.8 3.0 3.2 3.3 3.4 3.5 3.4
2.9 2.9 2.8 3.0 2.9 2.7 2.8 3.0 3.1 3.0 3.1 3.4 2.9 2.9 3.0 3.0 2.9 2.7 2.6 2.5 2.6 2.9 4.5 6.2 4.9 3.2 5.0 6.3 6.4 5.3 5.8 6.5 4.9 3.6 3.0 2.9
2.5 2.6 2.6 2.9 3.5 3.6 3.4 3.8 3.8 4.3 3.0 2.7 2.6 2.8 2.9 4.4 5.5 6.2 7.2 8.0 8.7 7.4 6.2 4.9 6.2 6.8 5.9 4.6 4.3 5.6 5.2 4.3 4.6 4.4 4.3 2.6
4.7 4.7 4.6 4.4 4.3 4.3 4.4 4.9 5.0 4.4 4.6 5.0 5.3 5.2 5.1 4.6 4.4 4.3 3.9 3.4 3.2 3.0 3.0 3.1 3.1 3.1 2.9 3.3 4.1 4.1 3.6 3.3 3.0 4.0 5.3 4.9

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.4	2.5	2.6	2.5	2.5	2.6	2.7	2.6	2.5	2.5	2.5	2.6	2.7	2.8	2.8	2.9	2.9	2.9	2.8	2.8	2.7	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.7
-.6	-.4	-.2	.2	.6	.9	1.8	1.3	1.4	1.7	1.2	1.1	1.2	1.3	1.2	1.0	.9	1.0	1.2	1.5	1.8	2.1	2.3	2.2	2.0	1.8	1.5	1.2	.9	.5	.1	-.2	-.3	-.7	-.8	-.8
-2.7	-2.4	-1.9	-1.4	-.9	-.5	-.2	-.1	-.1	-.3	-.6	-.7	-.8	-.9	-1.1	-1.2	-1.1	-.7	-.1	.3	.7	1.0	1.1	.8	.3	-.2	-.5	-.7	-1.0	-1.4	-1.7	-2.1	-2.3	-2.6	-2.8	-2.8
-3.5	-3.2	-2.9	-2.3	-1.8	-1.1	-1.0	-1.1	-1.3	-1.6	-1.9	-2.1	-2.2	-2.2	-2.1	-2.1	-2.0	-1.9	-1.4	-1.2	-1.0	-.9	-1.1	-1.3	-1.4	-1.5	-1.6	-1.6	-1.7	-1.9	-2.2	-2.6	-3.1	-3.5	-3.7	-3.7
-3.0	-2.7	-2.6	-2.3	-1.9	-1.8	-1.7	-1.7	-1.9	-2.2	-2.5	-2.7	-2.5	-2.3	-2.1	-2.0	-2.1	-2.3	-2.3	-2.2	-1.9	-2.1	-2.1	-2.1	-2.1	-2.0	-2.0	-2.0	-1.9	-2.0	-2.3	-2.6	-3.0	-3.2	-3.2	-3.0
-2.7	-2.4	-2.3	-2.2	-2.1	-2.4	-2.5	-2.5	-2.5	-2.7	-2.8	-2.7	-2.5	-2.3	-2.2	-2.3	-2.4	-2.6	-2.6	-2.6	-2.5	-2.6	-2.6	-2.6	-2.8	-2.8	-2.8	-2.7	-2.6	-2.6	-2.8	-2.9	-3.0	-2.9	-2.8	-2.5
-3.4	-3.1	-2.9	-2.8	-2.8	-3.2	-3.3	-3.2	-3.2	-3.3	-3.3	-3.3	-3.2	-2.9	-2.7	-2.9	-3.1	-3.4	-3.4	-3.4	-3.3	-3.4	-3.4	-3.4	-3.9	-4.0	-4.0	-3.9	-3.8	-3.8	-4.0	-4.2	-4.2	-3.9	-3.8	-3.4
-4.5	-4.2	-4.0	-3.9	-3.8	-4.0	-4.1	-4.0	-4.2	-4.2	-4.3	-4.3	-4.4	-4.2	-4.0	-4.0	-4.1	-4.3	-4.6	-4.5	-4.5	-4.6	-4.5	-4.5	-4.7	-4.7	-4.8	-4.7	-4.7	-4.8	-4.9	-5.0	-5.1	-5.0	-4.9	-4.6
-4.9	-4.7	-4.6	-4.6	-4.5	-4.5	-4.6	-4.6	-4.7	-4.6	-4.6	-4.5	-4.6	-4.6	-4.6	-4.4	-4.6	-4.6	-4.8	-4.6	-4.6	-4.6	-4.8	-4.7	-4.7	-4.8	-4.7	-4.8	-4.9	-5.0	-5.0	-5.0	-4.9	-4.9	-5.1	-5.1
-4.9	-4.7	-4.7	-4.6	-4.6	-4.5	-4.6	-4.6	-4.8	-4.7	-4.5	-4.5	-4.5	-4.6	-4.5	-4.6	-4.8	-4.7	-4.8	-4.5	-4.5	-4.6	-4.7	-4.8	-4.6	-4.8	-4.8	-4.9	-4.8	-4.9	-4.9	-4.9	-4.9	-5.0	-5.0	-5.1
-4.5	-4.6	-4.5	-4.2	-4.2	-4.1	-4.1	-4.2	-4.3	-4.4	-4.4	-4.5	-4.4	-4.2	-4.0	-4.1	-4.3	-4.5	-4.6	-4.4	-4.4	-4.2	-4.2	-4.4	-4.3	-4.5	-4.4	-4.4	-4.5	-4.6	-4.6	-4.8	-4.9	-5.1	-4.8	-4.8
-3.4	-3.9	-3.9	-3.7	-3.5	-3.4	-3.2	-3.3	-3.2	-3.4	-3.6	-3.9	-3.8	-3.5	-3.3	-3.2	-3.2	-3.5	-3.5	-3.5	-3.4	-3.3	-3.8	-3.3	-3.1	-3.2	-3.1	-3.1	-3.0	-3.0	-3.1	-3.1	-3.3	-3.5	-3.5	-3.8
-2.0	-2.3	-2.5	-2.3	-2.4	-2.5	-2.4	-2.5	-2.2	-2.3	-2.4	-2.5	-2.6	-2.6	-2.5	-2.6	-2.4	-2.6	-2.5	-2.7	-2.7	-2.7	-2.6	-2.5	-2.2	-2.1	-2.0	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-1.8	-1.9
-1.3	-1.3	-1.4	-1.4	-1.5	-1.5	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.4	-1.4	-1.6	-1.7	-1.8	-2.1	-2.2	-2.4	-2.4	-2.4	-2.4	-2.4	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.7	-1.5	-1.5	-1.4	-1.3	-1.3
-1.2	-1.1	-1.1	-1.3	-1.3	-1.1	-.9	-.8	-.5	-.4	-.2	-.1	-.1	-.2	-.4	-.4	-.5	-.9	-1.2	-1.5	-1.7	-1.7	-1.8	-2.0	-2.0	-1.9	-2.0	-2.1	-1.9	-1.8	-1.7	-1.5	-1.2	-1.1	-1.1	-1.1
-.3	-.3	-.3	-.2	-.1	.0	.3	.7	1.1	1.5	1.7	1.9	2.1	2.2	2.2	2.3	2.3	2.1	1.7	1.3	1.0	.9	1.0	.9	.6	.5	.7	.6	.5	.5	.5	.4	.2	.0	.0	-.2
2.0	2.0	2.0	2.2	2.4	2.4	2.5	3.0	3.3	3.7	3.9	4.1	4.1	4.1	4.2	4.1	4.3	4.5	4.5	4.5	4.6	4.9	4.8	5.2	5.0	5.0	5.3	4.7	5.1	5.4	5.2	4.7	3.5	3.1	2.8	2.4
4.8	4.9	5.0	5.0	5.0	5.0	5.3	5.8	6.8	6.6	6.2	6.0	5.9	6.0	6.2	6.3	6.4	6.5	6.8	7.2	7.7	8.2	8.2	7.4	7.3	7.1	6.9	7.0	6.8	7.0	7.1	7.2	6.7	5.7	5.2	5.0

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



3.2	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.8	2.9	3.0	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.2	3.2	3.2	3.2	3.3	3.3	3.4	3.5	3.6	3.6	3.6	3.5	3.5	3.4	3.3
2.7	2.4	2.2	1.9	1.7	1.6	1.6	1.5	1.6	1.6	1.9	2.2	2.4	2.7	2.9	3.0	3.0	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.5	2.7	2.9	3.1	3.3	3.4	3.5	3.2	3.2	3.1	2.9
1.9	1.5	1.3	1.3	1.2	1.2	1.3	1.3	1.4	1.5	1.7	1.9	2.1	2.4	2.6	2.8	2.8	2.5	2.3	2.1	1.9	1.7	1.6	1.6	1.6	1.8	1.8	1.9	2.1	2.3	2.4	2.4	2.3	2.3	2.3	2.2
1.2	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.5	1.6	1.7	1.8	2.2	2.3	2.3	2.3	1.9	1.6	1.4	1.2	1.2	1.3	1.1	1.0	1.2	1.3	1.3	1.5	1.5	1.4	1.4	1.3	1.3	1.4	1.3
1.3	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.5	1.4	1.4	1.5	1.6	1.8	1.8	1.6	1.6	1.5	1.3	1.3	1.2	1.2	1.3	1.2	1.3	1.4	1.5	1.6	1.6	1.4	1.3	1.2	1.3	1.3	1.2	1.2
1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.6	1.4	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.5	1.4	1.5	1.5	1.4	1.5	1.5	1.7	1.7	1.8	1.9	1.8	1.7	1.7	1.7	1.7	1.6	1.6	1.7
2.0	1.9	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.8	1.9	1.9	1.8	1.8	1.7	1.8	1.7	1.9	1.8	1.9	1.9	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	1.9	2.0
2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
2.1	2.2	2.2	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1
1.8	2.0	2.1	2.0	2.1	1.9	2.0	2.1	1.9	2.0	1.9	2.0	2.0	1.9	1.8	1.8	1.8	1.6	1.8	1.7	1.8	1.9	1.8	1.8	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8
1.7	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.6	1.7	1.6	1.6	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.5	1.6	1.6	1.6	1.8
2.0	2.0	1.8	1.7	1.7	1.8	1.7	1.8	1.8	1.7	1.8	1.8	1.9	2.0	2.0	2.0	1.9	2.1	2.1	1.7	1.6	1.7	1.5	1.4	1.6	1.7	1.6	1.4	1.6	1.5	1.4	1.5	1.6	1.8	2.0	2.0
2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.3	2.2	2.3	2.4	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.2	2.2	2.1	1.9	2.0	2.2	2.2
2.9	2.9	3.0	3.1	3.2	3.1	3.0	3.1	3.0	3.0	2.8	2.6	2.5	2.5	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.1	2.2	2.5	2.6	2.5	2.3	2.5	2.6	2.4	2.4	2.3	2.6	2.8	2.8
3.2	3.1	3.2	3.2	3.3	3.2	3.2	3.4	3.2	3.0	2.8	2.8	2.7	2.5	2.5	2.4	2.3	2.1	2.1	2.0	2.1	2.1	2.3	2.1	1.9	1.7	1.4	1.7	2.0	2.4	2.6	2.7	2.9	3.0	3.1	3.2

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

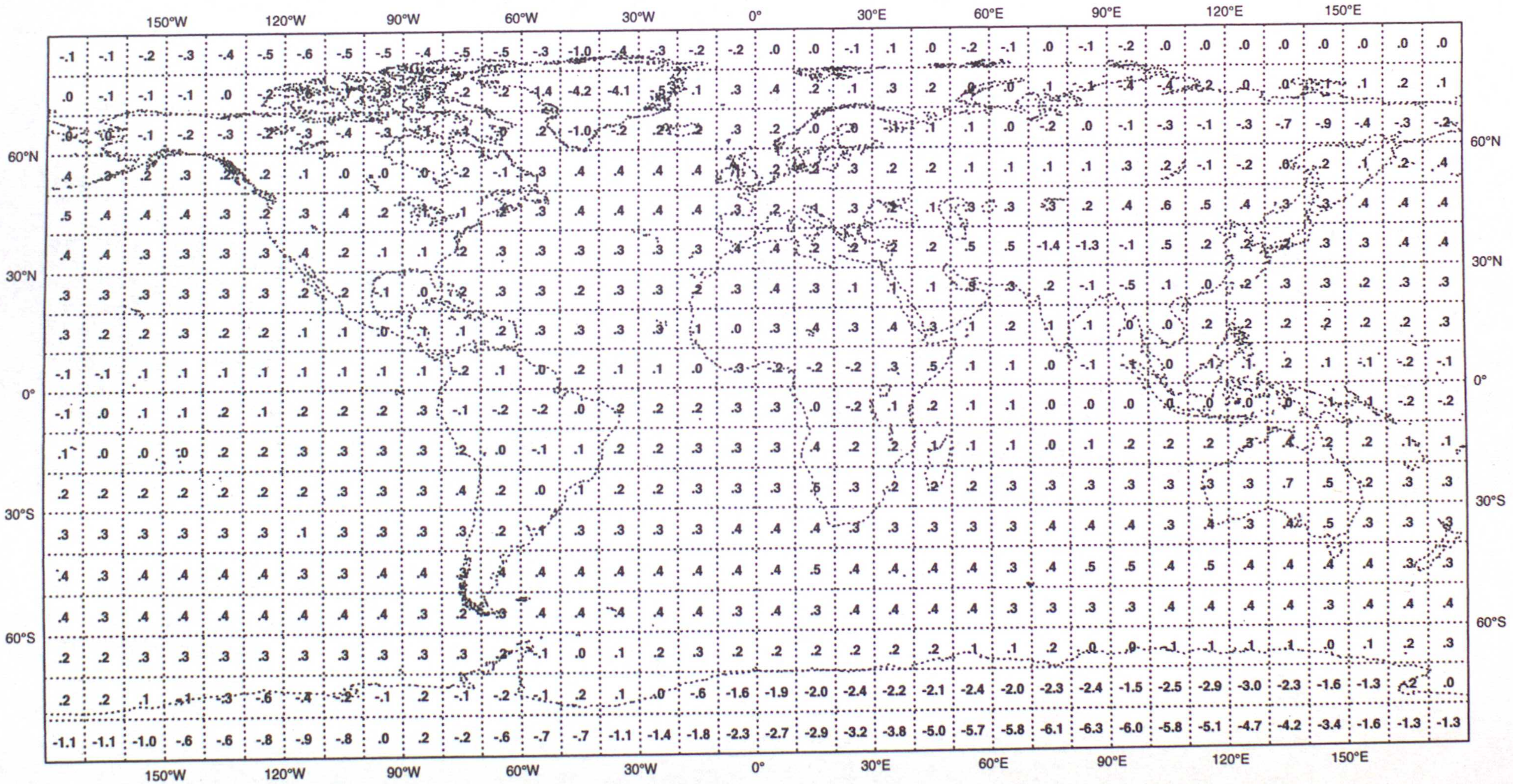

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-.1 -.1 -.2 -.3 -.4 -.5 -.6 -.5 -.5 -.4 -.5 -.5 -.3 -1.0 -.4 -.3 -.2 -.2 .0 .0 -.1 .1 .0 -.2 -.1 .0 -.1 -.2 .0 .0 .0 .0 .0 .0 .0 .0
.0 -.1 -.1 -.1 .0 -.2 .6 -.1 .3 .5 -.2 -.2 -1.4 -4.2 -4.1 -.5 .1 .3 .4 .2 .1 .3 .2 .0 .0 .1 -.1 -.4 -.4 .2 .0 .0 -.1 .1 .2 .1
.0 .0 -.1 -.2 -.3 -.2 -.3 -.4 -.3 -.1 -.1 .0 .2 -1.0 -.2 .2 .2 .3 .2 .0 .0 -.1 .1 .1 .0 -.2 .0 -.1 -.3 -.1 -.3 -.7 -.9 -.4 -.3 -.2
.4 .3 .2 .3 .2 .2 .1 .0 .0 .0 -.2 -.1 .3 .4 .4 .4 .4 .4 .2 .2 .3 .2 .2 .1 .1 .1 .1 .3 .2 -.1 -.2 .0 .2 .1 .2 .4
.5 .4 .4 .4 .3 .2 .3 .4 .2 .1 .1 .2 .3 .4 .4 .4 .4 .3 .2 .1 .3 .2 .1 .3 .3 .3 .2 .4 .6 .5 .4 .3 .3 .4 .4 .4
.4 .4 .3 .3 .3 .3 .4 .2 .1 .1 .2 .3 .3 .3 .3 .3 .3 .4 .4 .2 .2 .2 .2 .5 .5 -1.4 -1.3 -.1 .5 .2 .2 .2 .3 .3 .4 .4
.3 .3 .3 .3 .3 .3 .2 .2 -.1 .0 .2 .3 .3 .2 .3 .3 .2 .3 .4 .3 .1 .1 .1 .5 .3 .2 -.1 -.5 .1 .0 .2 .3 .3 .2 .3 .3
.3 .2 .2 .3 .2 .2 .1 .1 .0 .1 .1 .2 .3 .3 .3 .3 .1 .0 .3 .4 .3 .4 .3 .1 .2 .1 .1 .0 .0 .2 .2 .2 .2 .2 .2 .3
-.1 -.1 .1 .1 .1 .1 .1 .1 .1 .1 -.2 .1 .0 .2 .1 .1 .0 -.3 -.2 -.2 -.2 .3 .5 .1 .1 .0 -.1 -.1 .0 -.1 .1 .2 .1 -.1 -.2 -.1
-.1 .0 .1 .1 .2 .1 .2 .2 .2 .3 -.1 -.2 -.2 .0 .2 .2 .2 .3 .3 .0 -.2 .1 .2 .1 .1 .0 .0 .0 .0 .0 .0 .0 -.1 -.1 -.2 -.2
.1 .0 .0 .0 .2 .2 .3 .3 .3 .3 .2 .0 -.1 .1 .2 .2 .3 .3 .3 .4 .2 .2 .1 .1 .1 .0 .1 .2 .2 .2 .3 .4 .2 .2 .1 .1
.2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .4 .2 .0 .1 .2 .2 .3 .3 .3 .5 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .7 .5 .2 .3 .3
.3 .3 .3 .3 .3 .3 .1 .3 .3 .3 .3 .2 .1 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .3 .4 .5 .3 .3 .3
.4 .3 .4 .4 .4 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .3 .4 .5 .5 .4 .5 .4 .4 .4 .4 .3 .3
.4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .2 .3 .4 .4 .4 .4 .4 .3 .4 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .4 .4 .4
.2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 -.1 .0 .1 .2 .3 .2 .2 .2 .2 .2 .2 .1 .1 .2 .0 .0 -.1 -.1 .1 .1 .0 .1 .2 .3
.2 .2 .1 .1 -.3 -.6 -.4 -.2 -.1 .2 -.1 -.2 -.1 .2 .1 .0 -.6 -1.6 -1.9 -2.0 -2.4 -2.2 -2.1 -2.4 -2.0 -2.3 -2.4 -1.5 -2.5 -2.9 -3.0 -2.3 -1.6 -1.3 .2 .0
-1.1 -1.1 -1.0 -.6 -.6 -.8 -.9 -.8 .0 .2 -.2 -.6 -.7 -.7 -1.1 -1.4 -1.8 -2.3 -2.7 -2.9 -3.2 -3.8 -5.0 -5.7 -5.8 -6.1 -6.3 -6.0 -5.8 -5.1 -4.7 -4.2 -3.4 -1.6 -1.3 -1.3

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

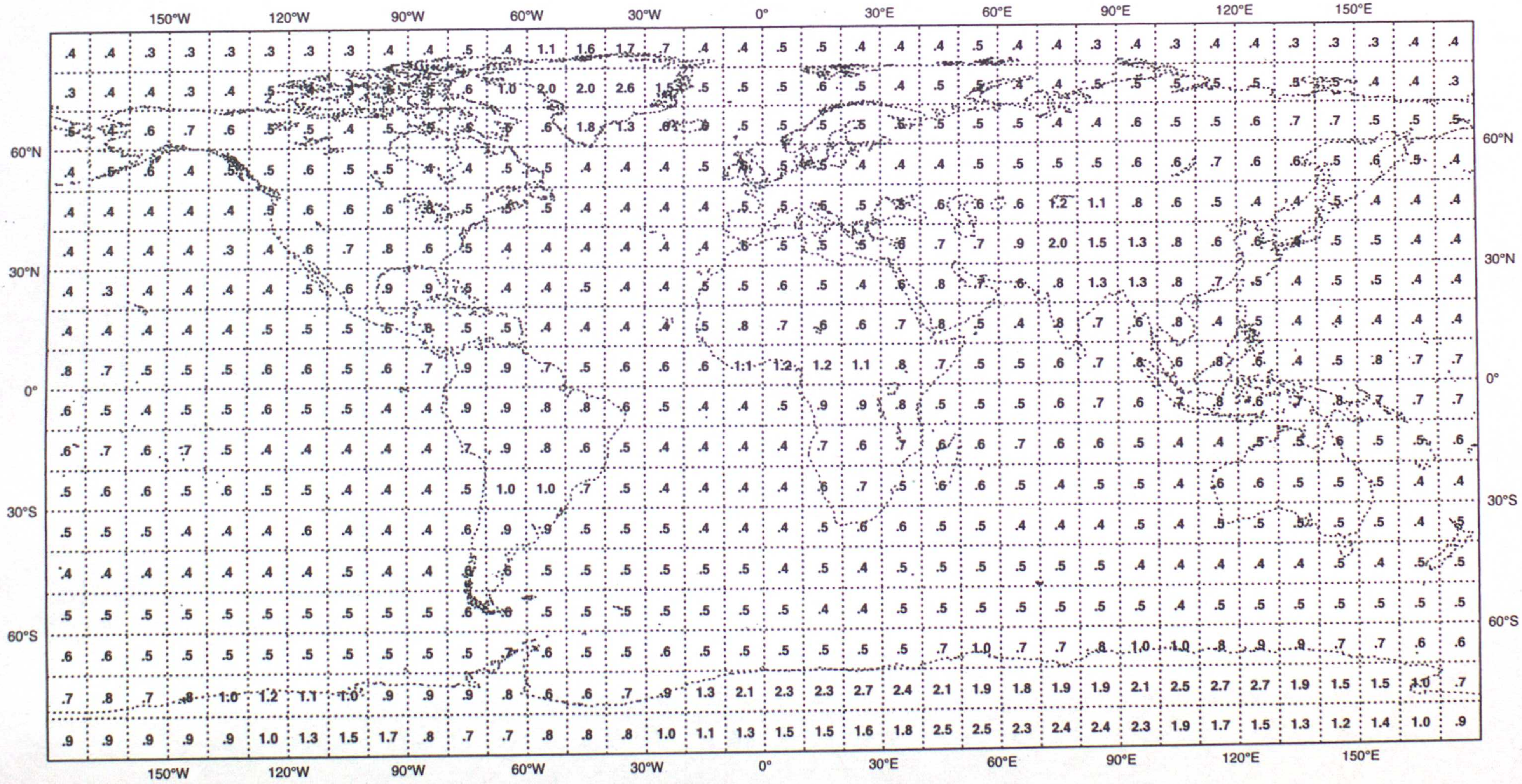

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .5 .4 1.1 1.6 1.7 .7 .4 .4 .5 .5 .4 .4 .4 .5 .4 .4 .3 .4 .3 .4 .4 .3 .3 .3 .4 .4
.3 .4 .4 .3 .4 .5 .4 .3 .5 .5 .6 1.0 2.0 2.0 2.6 1.5 .5 .5 .5 .6 .5 .4 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .3
.5 .4 .6 .7 .6 .5 .5 .4 .5 .5 .5 .5 .6 1.8 1.3 .6 .9 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .6 .5 .5 .6 .7 .7 .5 .5 .5
.4 .5 .6 .4 .5 .5 .6 .5 .5 .4 .4 .5 .5 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .6 .6 .7 .6 .6 .5 .6 .5 .4
.4 .4 .4 .4 .4 .5 .6 .6 .6 .8 .5 .5 .5 .4 .4 .4 .4 .5 .5 .6 .5 .5 .6 .6 .6 1.2 1.1 .8 .6 .5 .4 .4 .5 .4 .4 .4
.4 .4 .4 .4 .3 .4 .6 .7 .8 .6 .5 .4 .4 .4 .4 .4 .4 .6 .5 .5 .5 .6 .7 .7 .9 2.0 1.5 1.3 .8 .6 .6 .6 .5 .5 .4 .4
.4 .3 .4 .4 .4 .4 .5 .6 .9 .9 .5 .4 .4 .5 .4 .4 .5 .5 .6 .5 .4 .6 .8 .7 .6 .8 1.3 1.3 .8 .7 .5 .4 .5 .5 .4 .4
.4 .4 .4 .4 .4 .5 .5 .5 .6 .8 .5 .5 .4 .4 .4 .4 .5 .8 .7 .6 .6 .7 .8 .5 .4 .8 .7 .6 .8 .4 .5 .4 .4 .4 .4 .4
.8 .7 .5 .5 .5 .6 .6 .5 .6 .7 .9 .9 .7 .5 .6 .6 .6 1.1 1.2 1.2 1.1 .8 .7 .5 .5 .6 .7 .8 .6 .8 .6 .4 .5 .8 .7 .7
.6 .5 .4 .5 .5 .6 .5 .5 .4 .4 .9 .9 .8 .8 .6 .5 .4 .4 .5 .9 .9 .8 .5 .5 .5 .6 .7 .6 .7 .8 .6 .7 .8 .7 .7 .7
.6 .7 .6 .7 .5 .4 .4 .4 .4 .4 .7 .9 .8 .6 .5 .4 .4 .4 .4 .7 .6 .7 .6 .6 .7 .6 .6 .5 .4 .4 .5 .5 .6 .5 .5 .6
.5 .6 .6 .5 .6 .5 .5 .4 .4 .4 .5 1.0 1.0 .7 .5 .4 .4 .4 .4 .6 .7 .5 .6 .6 .5 .4 .5 .5 .4 .6 .6 .5 .5 .5 .4 .4
.5 .5 .5 .4 .4 .4 .6 .4 .4 .4 .6 .9 .9 .5 .5 .5 .4 .4 .4 .5 .6 .6 .5 .5 .4 .4 .4 .5 .4 .5 .5 .5 .5 .5 .4 .5
.4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .6 .6 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5
.6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .7 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .7 1.0 .7 .7 .8 1.0 1.0 .8 .9 .9 .7 .7 .6 .6
.7 .8 .7 .8 1.0 1.2 1.1 1.0 .9 .9 .9 .8 .6 .6 .7 .9 1.3 2.1 2.3 2.3 2.7 2.4 2.1 1.9 1.8 1.9 1.9 2.1 2.5 2.7 2.7 1.9 1.5 1.5 1.0 .7
.9 .9 .9 .9 .9 1.0 1.3 1.5 1.7 .8 .7 .7 .8 .8 .8 1.0 1.1 1.3 1.5 1.5 1.6 1.8 2.5 2.5 2.3 2.4 2.4 2.3 1.9 1.7 1.5 1.3 1.2 1.4 1.0 .9

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

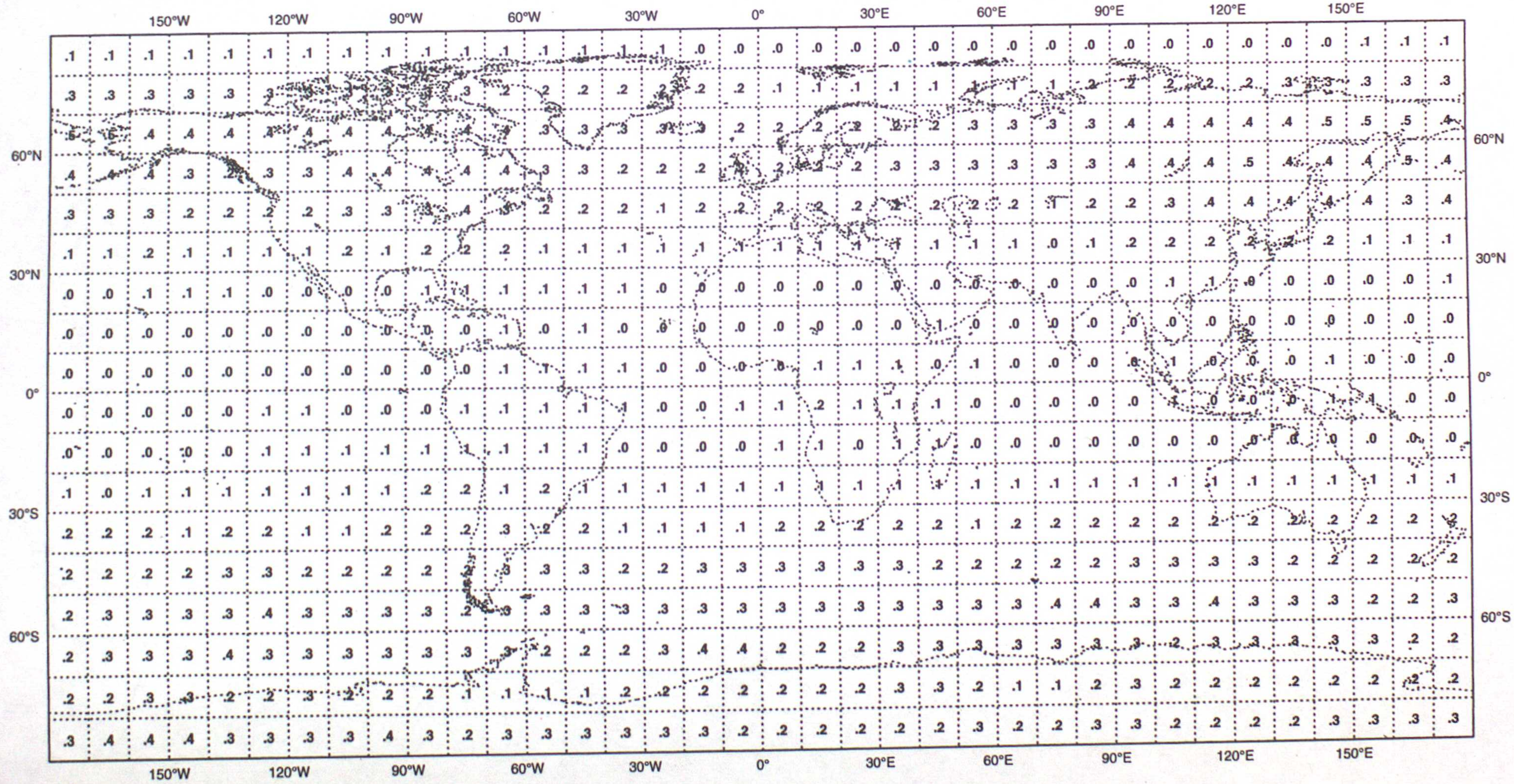

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

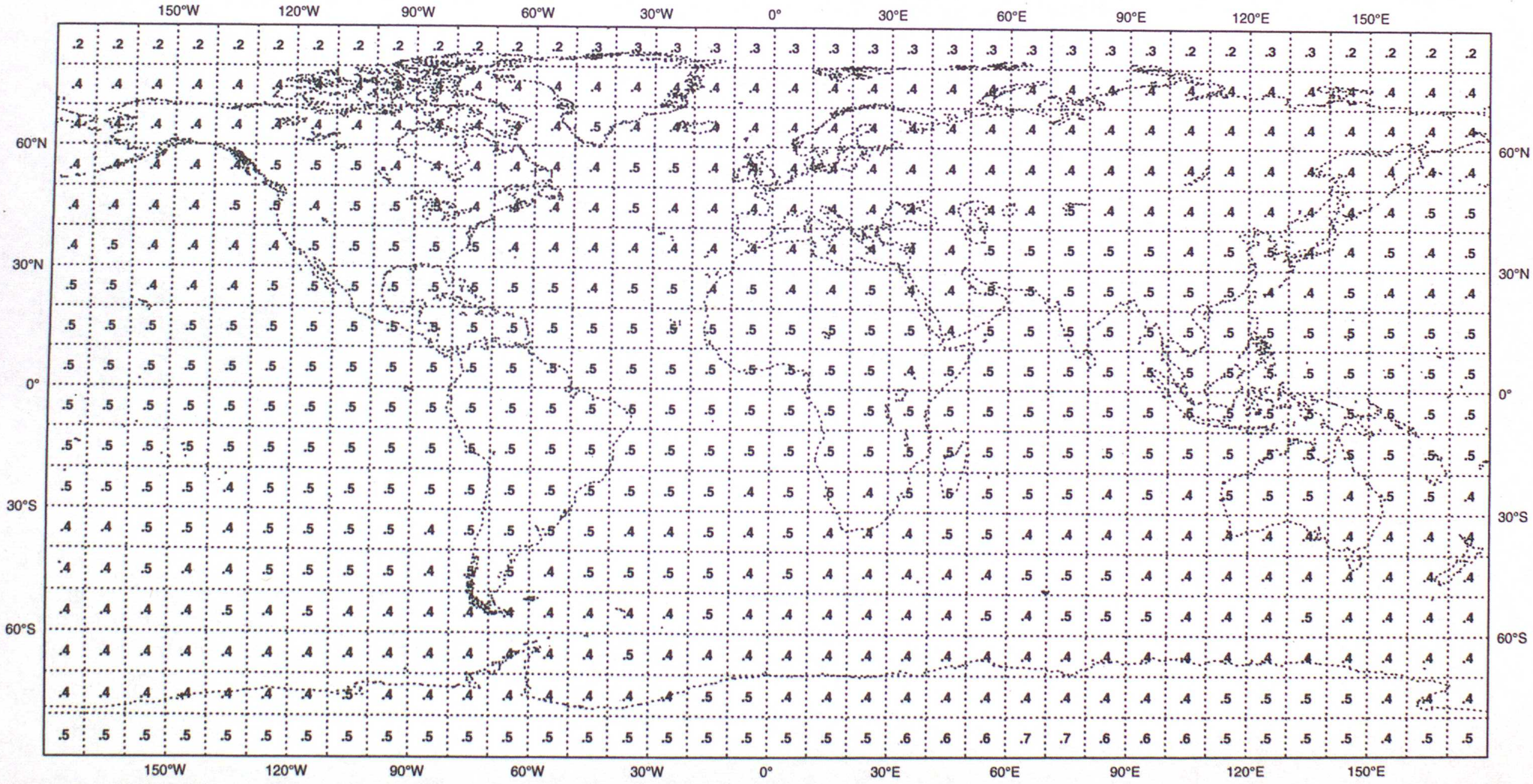

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .2 .2 .2 .2
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5
.4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .5 .5 .4 .4 .5 .4 .5
.5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .4 .5 .4 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .6 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .6 .4 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .4 .5 .5 .4
.4 .4 .5 .5 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .4 .5 .4 .5 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .5 .4 .4 .5 .5 .5 .5 .4 .5 .5 .4 .5 .5 .5 .5 .4 .5 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5 .5 .4 .4 .4 .5 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .7 .7 .6 .6 .6 .5 .5 .5 .5 .4 .5 .5

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

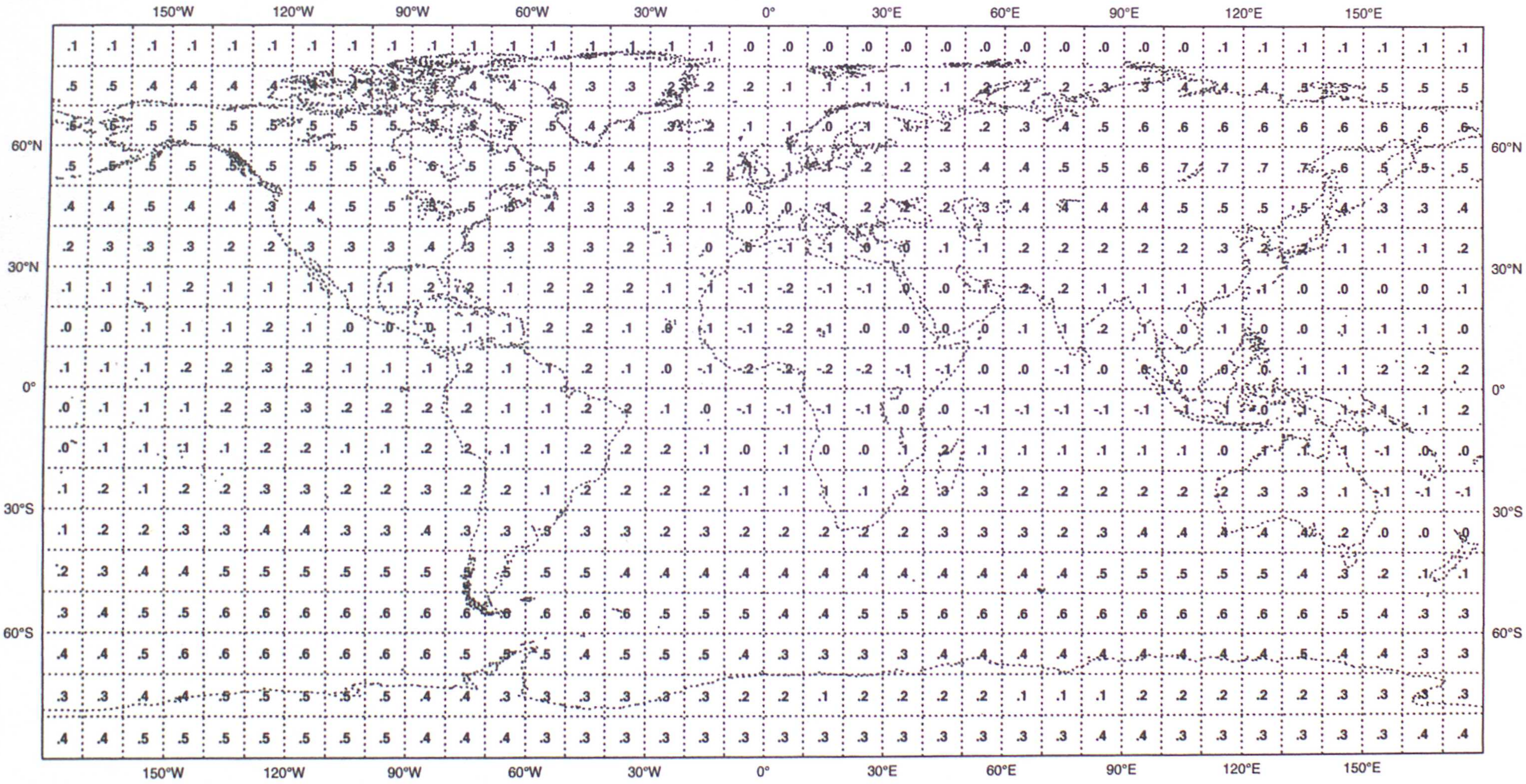

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

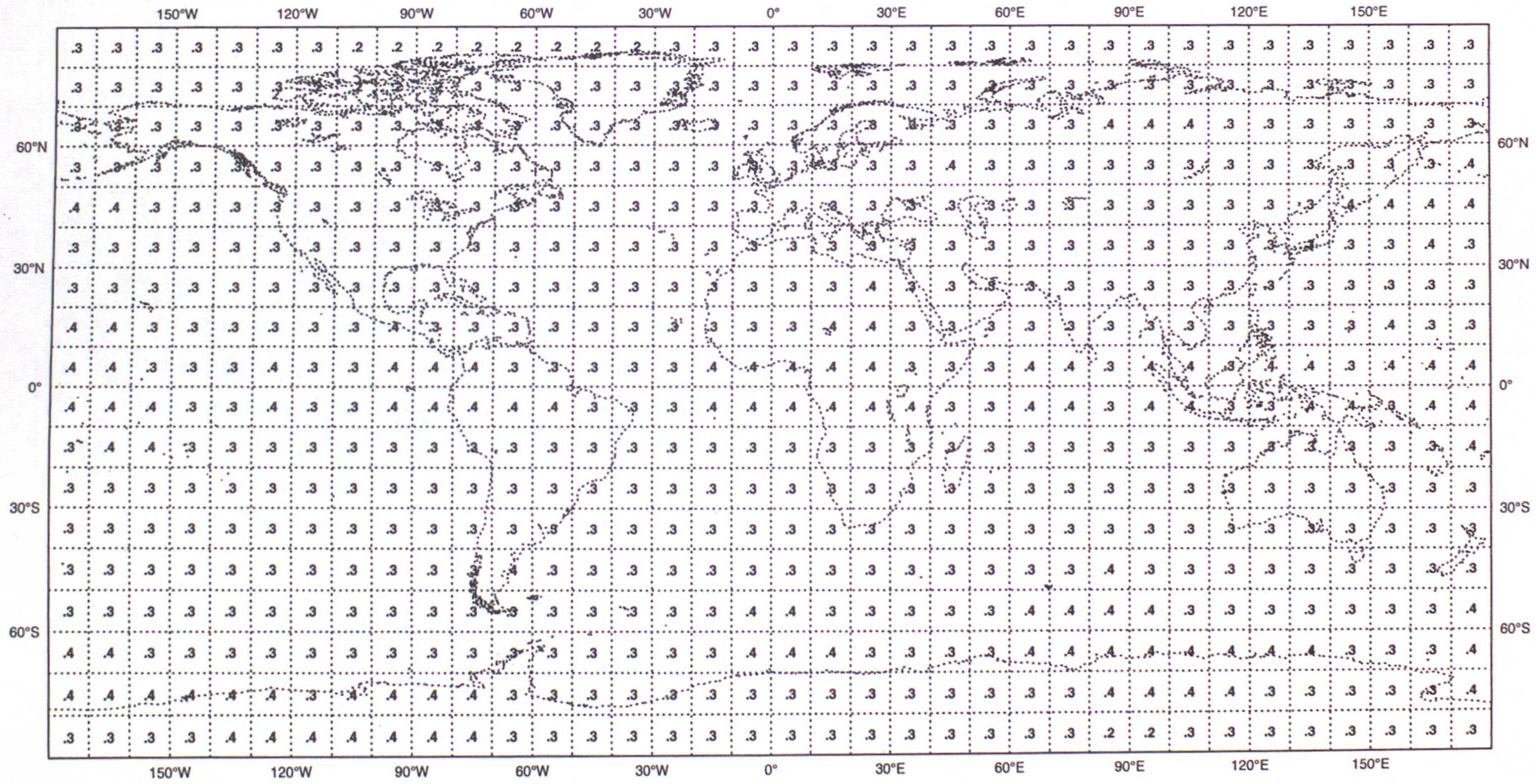
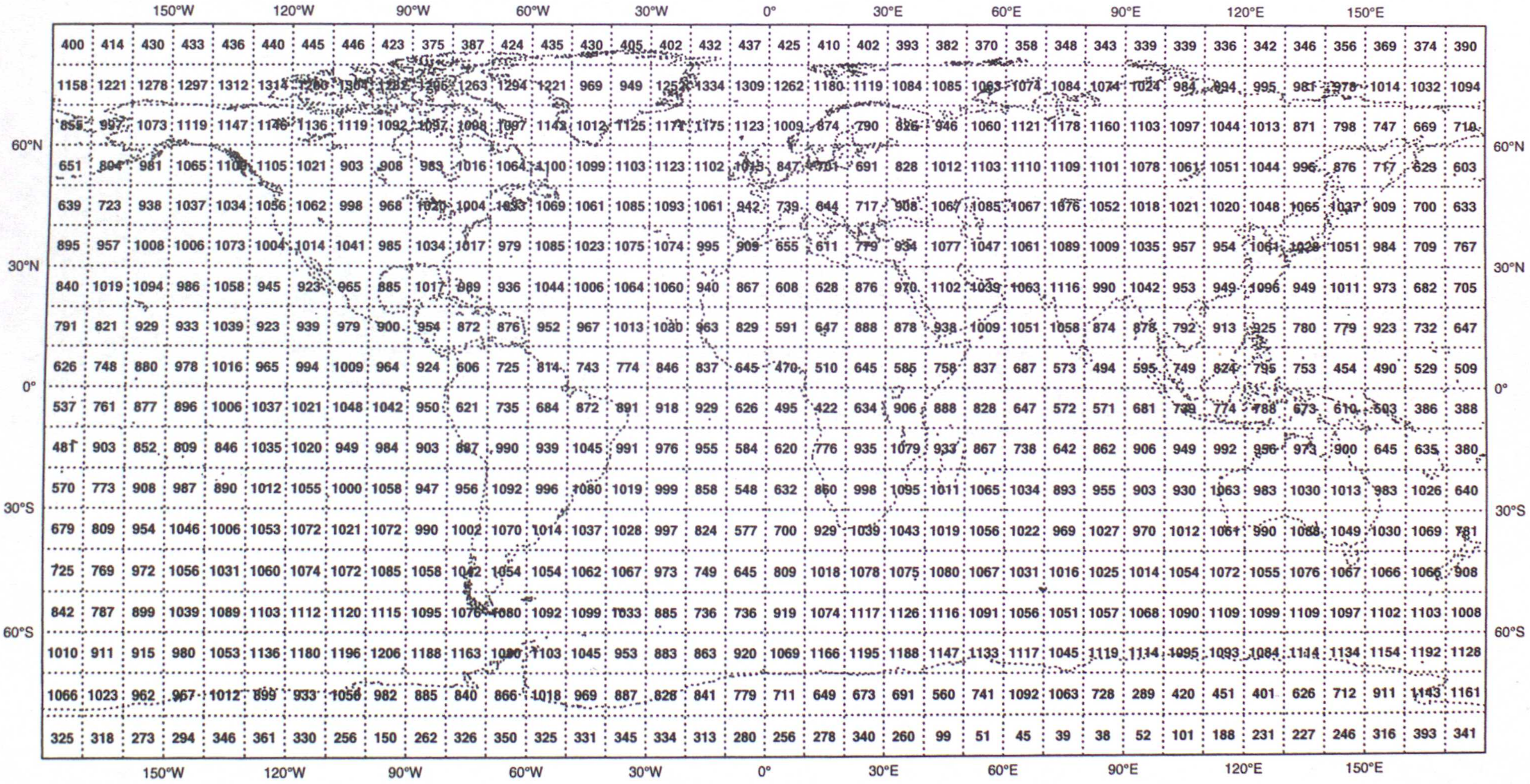
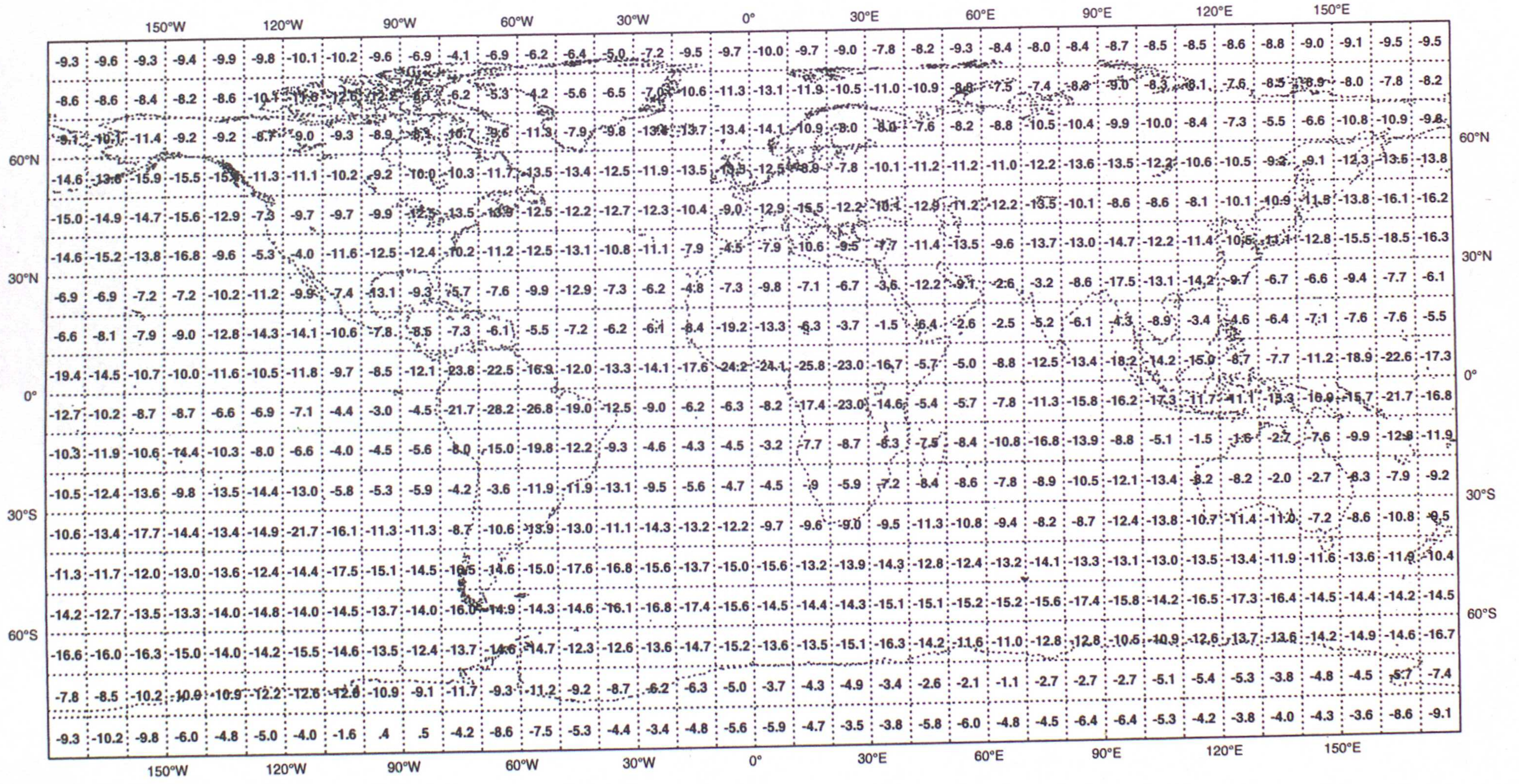

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 40. ATOVS mean daily count. APRIL 2004
NOAA16, using all observations
Global average number of observations in 24 hours = 567628



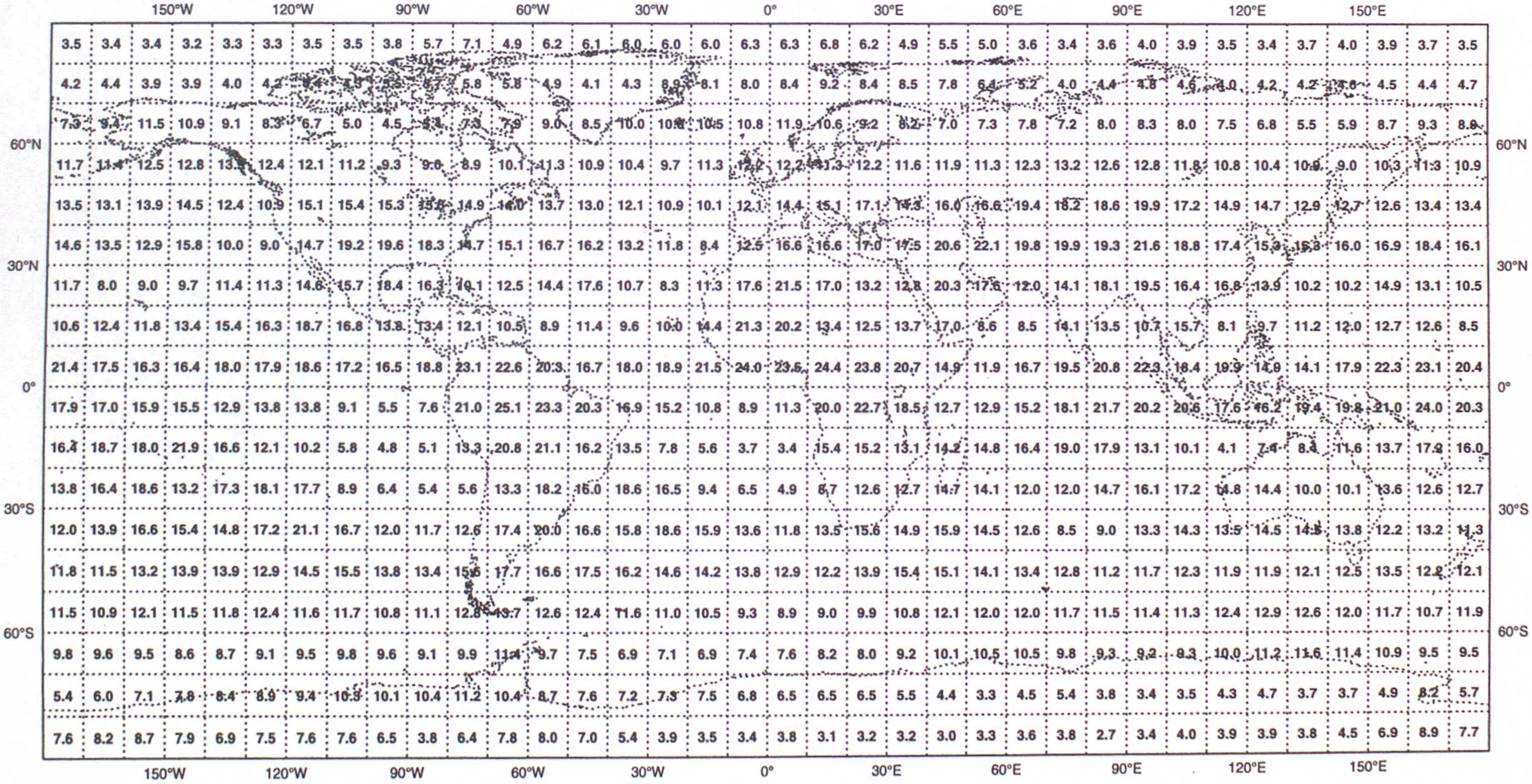
400	414	430	433	436	440	445	446	423	375	387	424	435	430	405	402	432	437	425	410	402	393	382	370	358	348	343	339	339	336	342	346	356	369	374	390
1158	1221	1278	1297	1312	1314	1280	1304	1282	1296	1263	1294	1221	969	949	1252	1334	1309	1262	1180	1119	1084	1085	1063	1074	1084	1074	1024	984	894	995	981	978	1014	1032	1094
855	997	1073	1119	1147	1146	1136	1119	1092	1097	1098	1097	1142	1012	1125	1171	1175	1123	1009	874	790	826	946	1060	1121	1178	1160	1103	1097	1044	1013	871	798	747	669	710
651	804	981	1065	1109	1105	1021	903	908	983	1016	1064	1100	1099	1103	1123	1102	1015	847	701	691	828	1012	1103	1110	1109	1101	1078	1061	1051	1044	996	876	717	629	603
639	723	938	1037	1034	1056	1062	998	968	1020	1004	1033	1069	1061	1085	1093	1061	942	739	644	717	908	1067	1085	1067	1076	1052	1018	1021	1020	1048	1065	1037	909	700	633
895	957	1008	1006	1073	1004	1014	1041	985	1034	1017	979	1085	1023	1075	1074	995	909	655	611	779	934	1077	1047	1061	1089	1009	1035	957	954	1061	1028	1051	984	709	767
840	1019	1094	986	1058	945	923	965	885	1017	989	936	1044	1006	1064	1060	940	867	608	628	876	970	1102	1039	1063	1116	990	1042	953	949	1096	949	1011	973	682	705
791	821	929	933	1039	923	939	979	900	954	872	876	952	967	1013	1030	963	829	591	647	888	878	938	1009	1051	1058	874	878	792	913	925	780	779	923	732	647
626	748	880	978	1016	965	994	1009	964	924	606	725	814	743	774	846	837	645	470	510	645	585	758	837	687	573	494	595	749	824	795	753	454	490	529	509
537	761	877	896	1006	1037	1021	1048	1042	950	621	735	684	872	891	918	929	626	495	422	634	906	888	828	647	572	571	681	739	774	788	673	610	503	386	388
481	903	852	809	846	1035	1020	949	984	903	887	990	939	1045	991	976	955	584	620	776	935	1079	933	867	738	642	862	906	949	992	956	973	900	645	635	380
570	773	908	987	890	1012	1055	1000	1058	947	956	1092	996	1080	1019	999	858	548	632	860	998	1095	1011	1065	1034	893	955	903	930	1063	983	1030	1013	983	1026	640
679	809	954	1046	1006	1053	1072	1021	1072	990	1002	1070	1014	1037	1028	997	824	577	700	929	1039	1043	1019	1056	1022	969	1027	970	1012	1061	990	1088	1049	1030	1069	781
725	769	972	1056	1031	1060	1074	1072	1085	1058	1042	1054	1054	1062	1067	973	749	645	809	1018	1078	1075	1080	1067	1031	1016	1025	1014	1054	1072	1055	1076	1067	1066	1066	908
842	787	899	1039	1089	1103	1112	1120	1115	1095	1076	1080	1092	1099	1033	885	736	736	919	1074	1117	1126	1116	1091	1056	1051	1057	1068	1090	1109	1099	1109	1097	1102	1103	1008
1010	911	915	980	1053	1136	1180	1196	1206	1188	1163	1090	1103	1045	953	883	863	920	1069	1166	1195	1188	1147	1133	1117	1045	1119	1114	1095	1093	1084	1114	1134	1154	1192	1128
1066	1023	962	967	1012	899	933	1056	982	885	840	866	1018	969	887	826	841	779	711	649	673	691	560	741	1092	1063	728	289	420	451	401	626	712	911	1143	1161
325	318	273	294	346	361	330	256	150	262	326	350	325	331	345	334	313	280	256	278	340	260	99	51	45	39	38	52	101	188	231	227	246	316	393	341

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



-9.3	-9.6	-9.3	-9.4	-9.9	-9.8	-10.1	-10.2	-9.6	-6.9	-4.1	-6.9	-6.2	-6.4	-5.0	-7.2	-9.5	-9.7	-10.0	-9.7	-9.0	-7.8	-8.2	-9.3	-8.4	-8.0	-8.4	-8.7	-8.5	-8.5	-8.6	-8.8	-9.0	-9.1	-9.5	-9.5
-8.6	-8.6	-8.4	-8.2	-8.6	-10.1	-11.8	-12.6	-12.2	[illegible]	-6.2	-5.3	-4.2	-5.6	-6.5	-7.0	-10.6	-11.3	-13.1	-11.9	-10.5	-11.0	-10.9	-8.8	-7.5	-7.4	-8.8	-9.0	-8.3	-8.1	-7.6	-8.5	-8.9	-8.0	-7.8	-8.2
-9.1	-10.1	-11.4	-9.2	-9.2	-8.7	-9.0	-9.3	-8.9	-8.3	-10.7	-9.6	-11.3	-7.9	-9.8	-13.8	-13.7	-13.4	-14.1	-10.9	-8.0	-8.0	-7.6	-8.2	-8.8	-10.5	-10.4	-9.9	-10.0	-8.4	-7.3	-5.5	-6.6	-10.8	-10.9	-9.8
-14.6	-13.6	-15.9	-15.5	[illegible]	-11.3	-11.1	-10.2	-9.2	-10.0	-10.3	-11.7	-13.5	-13.4	-12.5	-11.9	-13.5	-13.5	-12.5	-8.9	-7.8	-10.1	-11.2	-11.2	-11.0	-12.2	-13.6	-13.5	-12.2	-10.6	-10.5	-9.2	-9.1	-12.3	-13.5	-13.8
-15.0	-14.9	-14.7	-15.6	-12.9	-7.3	-9.7	-9.7	-9.9	-12.5	-13.5	-13.9	-12.5	-12.2	-12.7	-12.3	-10.4	-9.0	-12.9	-15.5	-12.2	-10.4	-12.9	-11.2	-12.2	-13.5	-10.1	-8.6	-8.6	-8.1	-10.1	-10.9	-11.8	-13.8	-16.1	-16.2
-14.6	-15.2	-13.8	-16.8	-9.6	-5.3	-4.0	-11.6	-12.5	-12.4	-10.2	-11.2	-12.5	-13.1	-10.8	-11.1	-7.9	-4.5	-7.9	-10.6	-9.5	-7.7	-11.4	-13.5	-9.6	-13.7	-13.0	-14.7	-12.2	-11.4	-10.5	-13.1	-12.8	-15.5	-18.5	-16.3
-6.9	-6.9	-7.2	-7.2	-10.2	-11.2	-9.9	-7.4	-13.1	-9.3	-5.7	-7.6	-9.9	-12.9	-7.3	-6.2	-4.8	-7.3	-9.8	-7.1	-6.7	-3.6	-12.2	-9.1	-2.6	-3.2	-8.6	-17.5	-13.1	-14.2	-9.7	-6.7	-6.6	-9.4	-7.7	-6.1
-6.6	-8.1	-7.9	-9.0	-12.8	-14.3	-14.1	-10.6	-7.8	-8.5	-7.3	-6.1	-5.5	-7.2	-6.2	-6.1	-8.4	-19.2	-13.3	-6.3	-3.7	-1.5	-6.4	-2.6	-2.5	-5.2	-6.1	-4.3	-8.9	-3.4	-4.6	-6.4	-7.1	-7.6	-7.6	-5.5
-19.4	-14.5	-10.7	-10.0	-11.6	-10.5	-11.8	-9.7	-8.5	-12.1	-23.8	-22.5	-16.9	-12.0	-13.3	-14.1	-17.6	-24.2	-24.1	-25.8	-23.0	-16.7	-5.7	-5.0	-8.8	-12.5	-13.4	-18.2	-14.2	-15.0	-8.7	-7.7	-11.2	-18.9	-22.6	-17.3
-12.7	-10.2	-8.7	-8.7	-6.6	-6.9	-7.1	-4.4	-3.0	-4.5	-21.7	-28.2	-26.8	-19.0	-12.5	-9.0	-6.2	-6.3	-8.2	-17.4	-23.0	-14.6	-5.4	-5.7	-7.8	-11.3	-15.8	-16.2	-17.3	-11.7	-11.1	-13.3	-10.9	-15.7	-21.7	-16.8
-10.3	-11.9	-10.6	-14.4	-10.3	-8.0	-6.6	-4.0	-4.5	-5.6	-8.0	-15.0	-19.8	-12.2	-9.3	-4.6	-4.3	-4.5	-3.2	-7.7	-8.7	-8.3	-7.5	-8.4	-10.8	-16.8	-13.9	-8.8	-5.1	-1.5	-1.6	-2.7	-7.6	-9.9	-12.8	-11.9
-10.5	-12.4	-13.6	-9.8	-13.5	-14.4	-13.0	-5.8	-5.3	-5.9	-4.2	-3.6	-11.9	-11.9	-13.1	-9.5	-5.6	-4.7	-4.5	-9	-5.9	-7.2	-8.4	-8.6	-7.8	-8.9	-10.5	-12.1	-13.4	-8.2	-8.2	-2.0	-2.7	-8.3	-7.9	-9.2
-10.6	-13.4	-17.7	-14.4	-13.4	-14.9	-21.7	-16.1	-11.3	-11.3	-8.7	-10.6	-13.9	-13.0	-11.1	-14.3	-13.2	-12.2	-9.7	-9.6	-9.0	-9.5	-11.3	-10.8	-9.4	-8.2	-8.7	-12.4	-13.8	-10.7	-11.4	-11.0	-7.2	-8.6	-10.8	-9.5
-11.3	-11.7	-12.0	-13.0	-13.6	-12.4	-14.4	-17.5	-15.1	-14.5	-16.5	-14.6	-15.0	-17.6	-16.8	-15.6	-13.7	-15.0	-15.6	-13.2	-13.9	-14.3	-12.8	-12.4	-13.2	-14.1	-13.3	-13.1	-13.0	-13.5	-13.4	-11.9	-11.6	-13.6	-11.9	-10.4
-14.2	-12.7	-13.5	-13.3	-14.0	-14.8	-14.0	-14.5	-13.7	-14.0	-16.0	-14.9	-14.3	-14.6	-16.1	-16.8	-17.4	-15.6	-14.5	-14.4	-14.3	-15.1	-15.1	-15.2	-15.2	-15.6	-17.4	-15.8	-14.2	-16.5	-17.3	-16.4	-14.5	-14.4	-14.2	-14.5
-16.6	-16.0	-16.3	-15.0	-14.0	-14.2	-15.5	-14.6	-13.5	-12.4	-13.7	-14.6	-14.7	-12.3	-12.6	-13.6	-14.7	-15.2	-13.6	-13.5	-15.1	-16.3	-14.2	-11.6	-11.0	-12.8	-12.8	-10.5	-10.9	-12.6	-13.7	-13.6	-14.2	-14.9	-14.6	-16.7
-7.8	-8.5	-10.2	-10.9	-10.9	-12.2	-12.6	-12.6	-10.9	-9.1	-11.7	-9.3	-11.2	-9.2	-8.7	-6.2	-6.3	-5.0	-3.7	-4.3	-4.9	-3.4	-2.6	-2.1	-1.1	-2.7	-2.7	-2.7	-5.1	-5.4	-5.3	-3.8	-4.8	-4.5	-5.7	-7.4
-9.3	-10.2	-9.8	-6.0	-4.8	-5.0	-4.0	-1.6	.4	.5	-4.2	-8.6	-7.5	-5.3	-4.4	-3.4	-4.8	-5.6	-5.9	-4.7	-3.5	-3.8	-5.8	-6.0	-4.8	-4.5	-6.4	-6.4	-5.3	-4.2	-3.8	-4.0	-4.3	-3.6	-8.6	-9.1

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



3.5	3.4	3.4	3.2	3.3	3.3	3.5	3.5	3.8	5.7	7.1	4.9	6.2	6.1	6.0	6.0	6.0	6.3	6.3	6.8	6.2	4.9	5.5	5.0	3.6	3.4	3.6	4.0	3.9	3.5	3.4	3.7	4.0	3.9	3.7	3.5
4.2	4.4	3.9	3.9	4.0	4.2	4.4	4.5	5.5	5.7	5.8	5.8	4.9	4.1	4.3	8.9	8.1	8.0	8.4	9.2	8.4	8.5	7.8	6.4	5.2	4.0	4.4	4.8	4.6	4.0	4.2	4.2	4.6	4.5	4.4	4.7
7.3	9.4	11.5	10.9	9.1	8.3	6.7	5.0	4.5	5.1	7.3	7.9	9.0	8.5	10.0	10.8	10.5	10.8	11.9	10.6	9.2	8.2	7.0	7.3	7.8	7.2	8.0	8.3	8.0	7.5	6.8	5.5	5.9	8.7	9.3	8.8
11.7	11.4	12.5	12.8	13.[illegible]	12.4	12.1	11.2	9.3	9.6	8.9	10.1	11.3	10.9	10.4	9.7	11.3	12.2	12.2	11.3	12.2	11.6	11.9	11.3	12.3	13.2	12.6	12.8	11.8	10.8	10.4	10.9	9.0	10.3	11.3	10.9
13.5	13.1	13.9	14.5	12.4	10.9	15.1	15.4	15.3	15.8	14.9	14.0	13.7	13.0	12.1	10.9	10.1	12.1	14.4	15.1	17.1	14.3	16.0	16.6	19.4	18.2	18.6	19.9	17.2	14.9	14.7	12.9	12.7	12.6	13.4	13.4
14.6	13.5	12.9	15.8	10.0	9.0	14.7	19.2	19.6	18.3	14.7	15.1	16.7	16.2	13.2	11.8	8.4	12.5	16.6	16.6	17.0	17.5	20.6	22.1	19.8	19.9	19.3	21.6	18.8	17.4	15.3	15.3	16.0	16.9	18.4	16.1
11.7	8.0	9.0	9.7	11.4	11.3	14.6	15.7	18.4	16.3	10.1	12.5	14.4	17.6	10.7	8.3	11.3	17.6	21.5	17.0	13.2	12.8	20.3	17.6	12.0	14.1	18.1	19.5	16.4	16.8	13.9	10.2	10.2	14.9	13.1	10.5
10.6	12.4	11.8	13.4	15.4	16.3	18.7	16.8	13.8	13.4	12.1	10.5	8.9	11.4	9.6	10.0	14.4	21.3	20.2	13.4	12.5	13.7	17.0	8.6	8.5	14.1	13.5	10.7	15.7	8.1	9.7	11.2	12.0	12.7	12.6	8.5
21.4	17.5	16.3	16.4	18.0	17.9	18.6	17.2	16.5	18.8	23.1	22.6	20.3	16.7	18.0	18.9	21.5	24.0	23.5	24.4	23.8	20.7	14.9	11.9	16.7	19.5	20.8	22.3	18.4	19.9	14.9	14.1	17.9	22.3	23.1	20.4
17.9	17.0	15.9	15.5	12.9	13.8	13.8	9.1	5.5	7.6	21.0	25.1	23.3	20.3	16.9	15.2	10.8	8.9	11.3	20.0	22.7	18.5	12.7	12.9	15.2	18.1	21.7	20.2	20.6	17.6	16.2	19.4	19.8	21.0	24.0	20.3
16.4	18.7	18.0	21.9	16.6	12.1	10.2	5.8	4.8	5.1	13.3	20.8	21.1	16.2	13.5	7.8	5.6	3.7	3.4	15.4	15.2	13.1	14.2	14.8	16.4	19.0	17.9	13.1	10.1	4.1	7.4	8.4	11.6	13.7	17.8	16.0
13.8	16.4	18.6	13.2	17.3	18.1	17.7	8.9	6.4	5.4	5.6	13.3	18.2	16.0	18.6	16.5	9.4	6.5	4.9	8.7	12.6	12.7	14.7	14.1	12.0	12.0	14.7	16.1	17.2	14.8	14.4	10.0	10.1	13.6	12.6	12.7
12.0	13.9	16.6	15.4	14.8	17.2	21.1	16.7	12.0	11.7	12.6	17.4	20.0	16.6	15.8	18.6	15.9	13.6	11.8	13.5	15.6	14.9	15.9	14.5	12.6	8.5	9.0	13.3	14.3	13.5	14.5	14.5	13.8	12.2	13.2	11.3
11.8	11.5	13.2	13.9	13.9	12.9	14.5	15.5	13.8	13.4	15.6	17.7	16.6	17.5	16.2	14.6	14.2	13.8	12.9	12.2	13.9	15.4	15.1	14.1	13.4	12.8	11.2	11.7	12.3	11.9	11.9	12.1	12.5	13.5	12.8	12.1
11.5	10.9	12.1	11.5	11.8	12.4	11.6	11.7	10.8	11.1	12.8	13.7	12.6	12.4	11.6	11.0	10.5	9.3	8.9	9.0	9.9	10.8	12.1	12.0	12.0	11.7	11.5	11.4	11.3	12.4	12.9	12.6	12.0	11.7	10.7	11.9
9.8	9.6	9.5	8.6	8.7	9.1	9.5	9.8	9.6	9.1	9.9	11.4	9.7	7.5	6.9	7.1	6.9	7.4	7.6	8.2	8.0	9.2	10.1	10.5	10.5	9.8	9.3	9.2	9.3	10.0	11.2	11.6	11.4	10.9	9.5	9.5
5.4	6.0	7.1	7.8	8.4	8.9	9.4	10.3	10.1	10.4	11.2	10.4	8.7	7.6	7.2	7.3	7.5	6.8	6.5	6.5	6.5	5.5	4.4	3.3	4.5	5.4	3.8	3.4	3.5	4.3	4.7	3.7	3.7	4.9	8.2	5.7
7.6	8.2	8.7	7.9	6.9	7.5	7.6	7.6	6.5	3.8	6.4	7.8	8.0	7.0	5.4	3.9	3.5	3.4	3.8	3.1	3.2	3.2	3.0	3.3	3.6	3.8	2.7	3.4	4.0	3.9	3.9	3.8	4.5	6.9	8.9	7.7

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

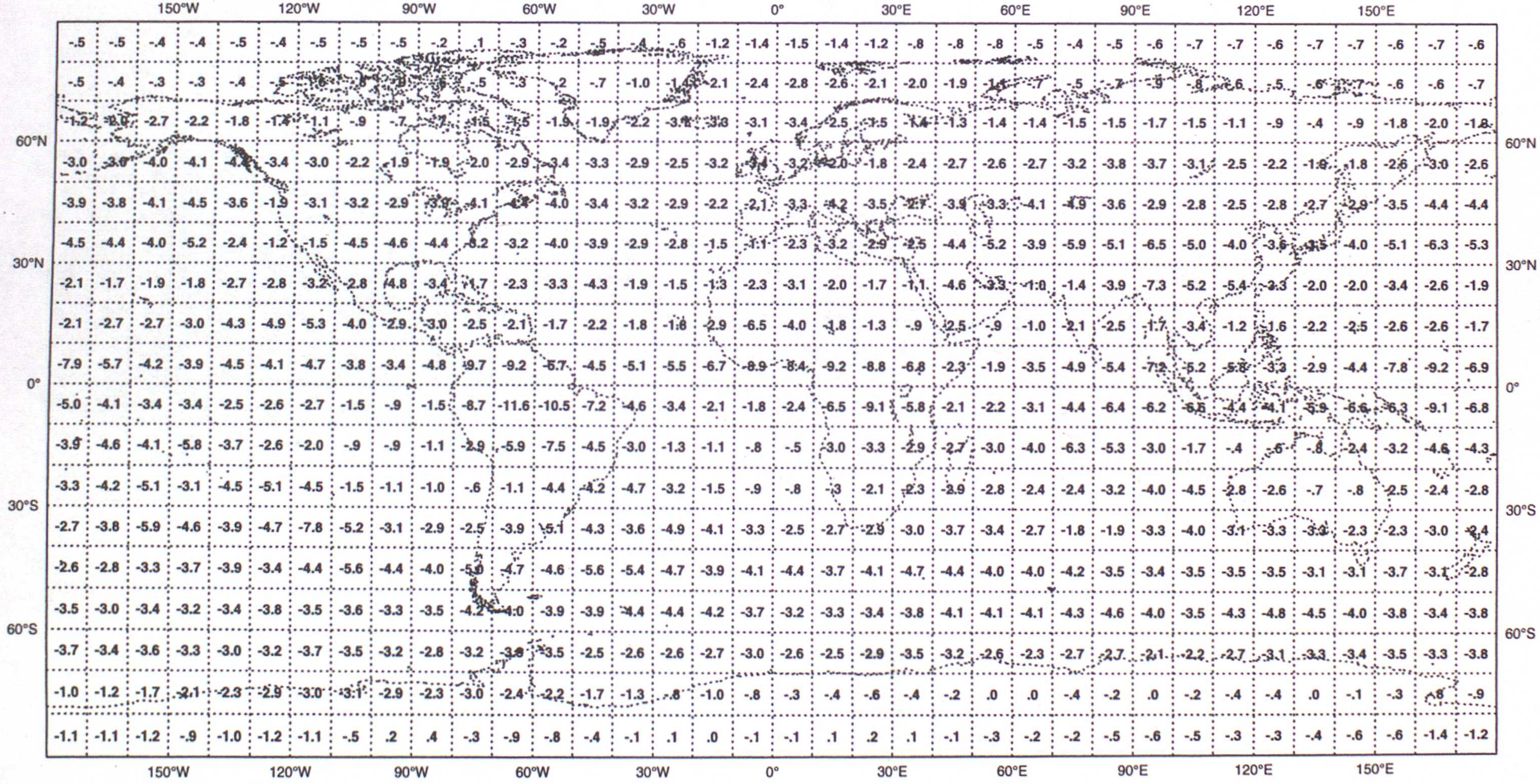
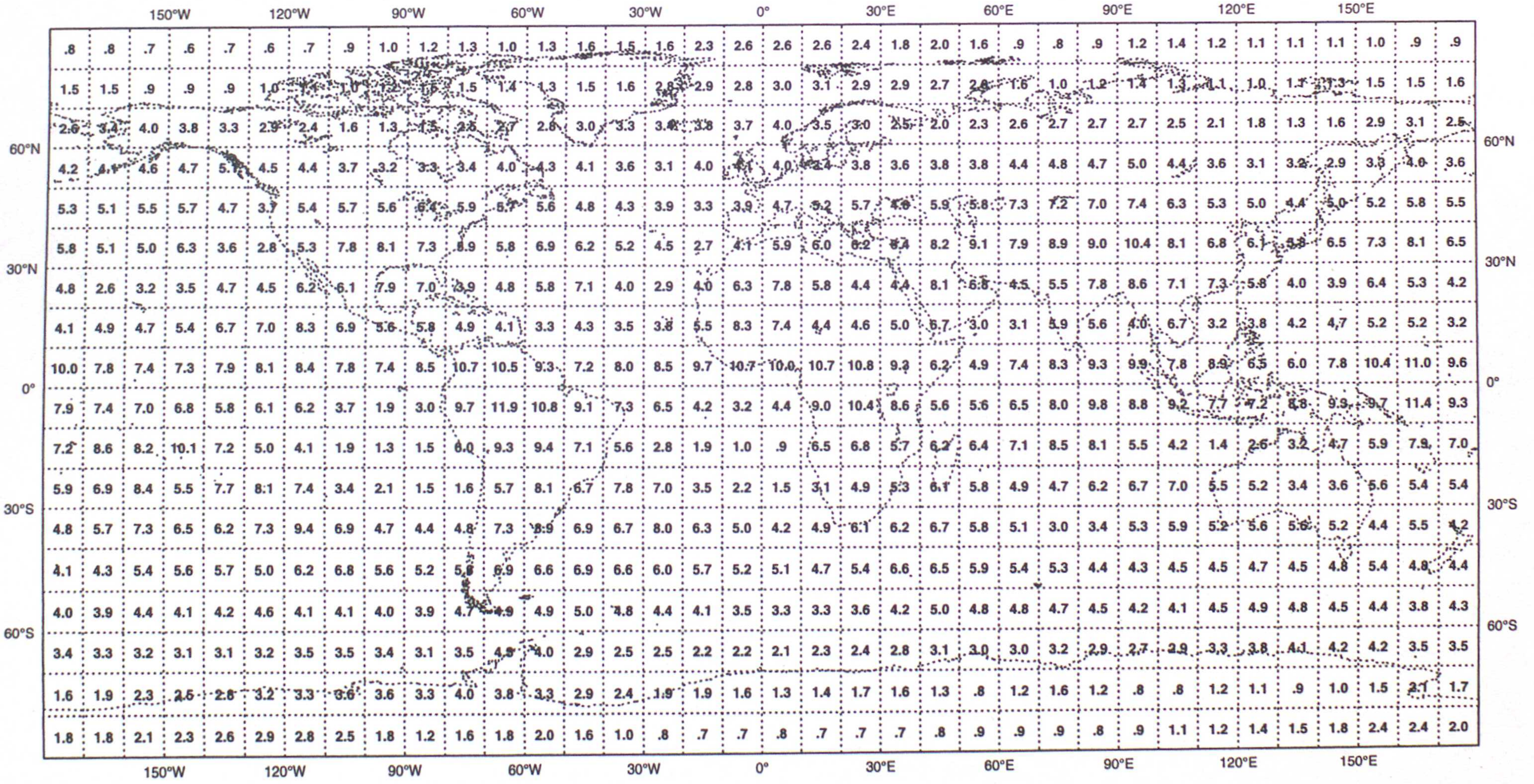

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.5 -.5 -.4 -.4 -.5 -.4 -.5 -.5 -.5 -.2 .1 -.3 -.2 -.5 -.4 -.6 -1.2 -1.4 -1.5 -1.4 -1.2 -.8 -.8 -.8 -.5 -.4 -.5 -.6 -.7 -.7 -.6 -.7 -.7 -.6 -.7 -.6
-.5 -.4 -.3 -.3 -.4 -.5 -.6 -.6 -.9 -.6 -.5 -.3 -.2 -.7 -1.0 -1.4 -2.1 -2.4 -2.8 -2.6 -2.1 -2.0 -1.9 -1.4 -.7 -.5 -.7 -.9 -.8 -.6 -.5 -.6 -.7 -.6 -.6 -.7
-1.2 -2.0 -2.7 -2.2 -1.8 -1.4 -1.1 -.9 -.7 -.7 -1.5 -1.5 -1.9 -1.9 -2.2 -3.1 -3.3 -3.1 -3.4 -2.5 -1.5 -1.4 -1.3 -1.4 -1.4 -1.5 -1.5 -1.7 -1.5 -1.1 -.9 -.4 -.9 -1.8 -2.0 -1.8
-3.0 -3.0 -4.0 -4.1 -4.2 -3.4 -3.0 -2.2 -1.9 -1.9 -2.0 -2.9 -3.4 -3.3 -2.9 -2.5 -3.2 -3.4 -3.2 -2.0 -1.8 -2.4 -2.7 -2.6 -2.7 -3.2 -3.8 -3.7 -3.1 -2.5 -2.2 -1.9 -1.8 -2.6 -3.0 -2.6
-3.9 -3.8 -4.1 -4.5 -3.6 -1.9 -3.1 -3.2 -2.9 -3.9 -4.1 -4.4 -4.0 -3.4 -3.2 -2.9 -2.2 -2.1 -3.3 -4.2 -3.5 -2.7 -3.9 -3.3 -4.1 -4.9 -3.6 -2.9 -2.8 -2.5 -2.8 -2.7 -2.9 -3.5 -4.4 -4.4
-4.5 -4.4 -4.0 -5.2 -2.4 -1.2 -1.5 -4.5 -4.6 -4.4 -3.2 -3.2 -4.0 -3.9 -2.9 -2.8 -1.5 -1.1 -2.3 -3.2 -2.9 -2.5 -4.4 -5.2 -3.9 -5.9 -5.1 -6.5 -5.0 -4.0 -3.6 -3.5 -4.0 -5.1 -6.3 -5.3
-2.1 -1.7 -1.9 -1.8 -2.7 -2.8 -3.2 -2.8 -4.8 -3.4 -1.7 -2.3 -3.3 -4.3 -1.9 -1.5 -1.3 -2.3 -3.1 -2.0 -1.7 -1.1 -4.6 -3.3 -1.0 -1.4 -3.9 -7.3 -5.2 -5.4 -3.3 -2.0 -2.0 -3.4 -2.6 -1.9
-2.1 -2.7 -2.7 -3.0 -4.3 -4.9 -5.3 -4.0 -2.9 -3.0 -2.5 -2.1 -1.7 -2.2 -1.8 -1.6 -2.9 -6.5 -4.0 -1.8 -1.3 -.9 -2.5 -.9 -1.0 -2.1 -2.5 -1.7 -3.4 -1.2 -1.6 -2.2 -2.5 -2.6 -2.6 -1.7
-7.9 -5.7 -4.2 -3.9 -4.5 -4.1 -4.7 -3.8 -3.4 -4.8 -9.7 -9.2 -6.7 -4.5 -5.1 -5.5 -6.7 -8.9 -8.4 -9.2 -8.8 -6.8 -2.3 -1.9 -3.5 -4.9 -5.4 -7.2 -5.2 -5.8 -3.3 -2.9 -4.4 -7.8 -9.2 -6.9
-5.0 -4.1 -3.4 -3.4 -2.5 -2.6 -2.7 -1.5 -.9 -1.5 -8.7 -11.6 -10.5 -7.2 -4.6 -3.4 -2.1 -1.8 -2.4 -6.5 -9.1 -5.8 -2.1 -2.2 -3.1 -4.4 -6.4 -6.2 -6.6 -4.4 -4.1 -5.9 -6.6 -6.3 -9.1 -6.8
-3.9 -4.6 -4.1 -5.8 -3.7 -2.6 -2.0 -.9 -.9 -1.1 -2.9 -5.9 -7.5 -4.5 -3.0 -1.3 -1.1 -.8 -.5 -3.0 -3.3 -2.9 -2.7 -3.0 -4.0 -6.3 -5.3 -3.0 -1.7 -.4 -.6 -.8 -2.4 -3.2 -4.6 -4.3
-3.3 -4.2 -5.1 -3.1 -4.5 -5.1 -4.5 -1.5 -1.1 -1.0 -.6 -1.1 -4.4 -4.2 -4.7 -3.2 -1.5 -.9 -.8 -.3 -2.1 -2.3 -2.9 -2.8 -2.4 -2.4 -3.2 -4.0 -4.5 -2.8 -2.6 -.7 -.8 -2.5 -2.4 -2.8
-2.7 -3.8 -5.9 -4.6 -3.9 -4.7 -7.8 -5.2 -3.1 -2.9 -2.5 -3.9 -5.1 -4.3 -3.6 -4.9 -4.1 -3.3 -2.5 -2.7 -2.9 -3.0 -3.7 -3.4 -2.7 -1.8 -1.9 -3.3 -4.0 -3.1 -3.3 -3.3 -2.3 -2.3 -3.0 -2.4
-2.6 -2.8 -3.3 -3.7 -3.9 -3.4 -4.4 -5.6 -4.4 -4.0 -5.0 -4.7 -4.6 -5.6 -5.4 -4.7 -3.9 -4.1 -4.4 -3.7 -4.1 -4.7 -4.4 -4.0 -4.0 -4.2 -3.5 -3.4 -3.5 -3.5 -3.5 -3.1 -3.1 -3.7 -3.1 -2.8
-3.5 -3.0 -3.4 -3.2 -3.4 -3.8 -3.5 -3.6 -3.3 -3.5 -4.2 -4.0 -3.9 -3.9 -4.4 -4.4 -4.2 -3.7 -3.2 -3.3 -3.4 -3.8 -4.1 -4.1 -4.1 -4.3 -4.6 -4.0 -3.5 -4.3 -4.8 -4.5 -4.0 -3.8 -3.4 -3.8
-3.7 -3.4 -3.6 -3.3 -3.0 -3.2 -3.7 -3.5 -3.2 -2.8 -3.2 -3.8 -3.5 -2.5 -2.6 -2.6 -2.7 -3.0 -2.6 -2.5 -2.9 -3.5 -3.2 -2.6 -2.3 -2.7 -2.7 -2.1 -2.2 -2.7 -3.1 -3.3 -3.4 -3.5 -3.3 -3.8
-1.0 -1.2 -1.7 -2.1 -2.3 -2.9 -3.0 -3.1 -2.9 -2.3 -3.0 -2.4 -2.2 -1.7 -1.3 -.8 -1.0 -.8 -.3 -.4 -.6 -.4 -.2 .0 .0 -.4 -.2 .0 -.2 -.4 -.4 .0 -.1 -.3 -.8 -.9
-1.1 -1.1 -1.2 -.9 -1.0 -1.2 -1.1 -.5 .2 .4 -.3 -.9 -.8 -.4 -.1 .1 .0 -.1 -.1 .1 .2 .1 -.1 -.3 -.2 -.2 -.5 -.6 -.5 -.3 -.3 -.4 -.6 -.6 -1.4 -1.2

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



.8	.8	.7	.6	.7	.6	.7	.9	1.0	1.2	1.3	1.0	1.3	1.6	1.5	1.6	2.3	2.6	2.6	2.6	2.4	1.8	2.0	1.6	.9	.8	.9	1.2	1.4	1.2	1.1	1.1	1.1	1.0	.9	.9
1.5	1.5	.9	.9	.9	1.0	1.4	1.0	1.2	1.5	1.5	1.4	1.3	1.5	1.6	2.8	2.9	2.8	3.0	3.1	2.9	2.9	2.7	2.8	1.6	1.0	1.2	1.4	1.3	1.1	1.0	1.1	1.3	1.5	1.5	1.6
2.6	3.4	4.0	3.8	3.3	2.9	2.4	1.6	1.3	1.5	2.5	2.7	2.8	3.0	3.3	3.4	3.8	3.7	4.0	3.5	3.0	2.5	2.0	2.3	2.6	2.7	2.7	2.7	2.5	2.1	1.8	1.3	1.6	2.9	3.1	2.5
4.2	4.1	4.6	4.7	5.1	4.5	4.4	3.7	3.2	3.3	3.4	4.0	4.3	4.1	3.6	3.1	4.0	4.1	4.0	2.4	3.8	3.6	3.8	3.8	4.4	4.8	4.7	5.0	4.4	3.6	3.1	3.2	2.9	3.3	4.0	3.6
5.3	5.1	5.5	5.7	4.7	3.7	5.4	5.7	5.6	6.4	5.9	5.7	5.6	4.8	4.3	3.9	3.3	3.9	4.7	5.2	5.7	4.6	5.9	5.8	7.3	7.2	7.0	7.4	6.3	5.3	5.0	4.4	5.0	5.2	5.8	5.5
5.8	5.1	5.0	6.3	3.6	2.8	5.3	7.8	8.1	7.3	8.9	5.8	6.9	6.2	5.2	4.5	2.7	4.1	5.9	6.0	6.2	8.4	8.2	9.1	7.9	8.9	9.0	10.4	8.1	6.8	6.1	5.8	6.5	7.3	8.1	6.5
4.8	2.6	3.2	3.5	4.7	4.5	6.2	6.1	7.9	7.0	3.9	4.8	5.8	7.1	4.0	2.9	4.0	6.3	7.8	5.8	4.4	4.4	8.1	6.8	4.5	5.5	7.8	8.6	7.1	7.3	5.8	4.0	3.9	6.4	5.3	4.2
4.1	4.9	4.7	5.4	6.7	7.0	8.3	6.9	5.6	5.8	4.9	4.1	3.3	4.3	3.5	3.8	5.5	8.3	7.4	4.4	4.6	5.0	6.7	3.0	3.1	5.9	5.6	4.0	6.7	3.2	3.8	4.2	4.7	5.2	5.2	3.2
10.0	7.8	7.4	7.3	7.9	8.1	8.4	7.8	7.4	8.5	10.7	10.5	9.3	7.2	8.0	8.5	9.7	10.7	10.0	10.7	10.8	9.3	6.2	4.9	7.4	8.3	9.3	9.9	7.8	8.9	6.5	6.0	7.8	10.4	11.0	9.6
7.9	7.4	7.0	6.8	5.8	6.1	6.2	3.7	1.9	3.0	9.7	11.9	10.8	9.1	7.3	6.5	4.2	3.2	4.4	9.0	10.4	8.6	5.6	5.6	6.5	8.0	9.8	8.8	9.2	7.7	7.2	8.8	9.3	9.7	11.4	9.3
7.2	8.6	8.2	10.1	7.2	5.0	4.1	1.9	1.3	1.5	6.0	9.3	9.4	7.1	5.6	2.8	1.9	1.0	.9	6.5	6.8	5.7	6.2	6.4	7.1	8.5	8.1	5.5	4.2	1.4	2.6	3.2	4.7	5.9	7.9	7.0
5.9	6.9	8.4	5.5	7.7	8.1	7.4	3.4	2.1	1.5	1.6	5.7	8.1	6.7	7.8	7.0	3.5	2.2	1.5	3.1	4.9	5.3	6.1	5.8	4.9	4.7	6.2	6.7	7.0	5.5	5.2	3.4	3.6	5.6	5.4	5.4
4.8	5.7	7.3	6.5	6.2	7.3	9.4	6.9	4.7	4.4	4.8	7.3	8.9	6.9	6.7	8.0	6.3	5.0	4.2	4.9	6.1	6.2	6.7	5.8	5.1	3.0	3.4	5.3	5.9	5.2	5.6	5.6	5.2	4.4	5.5	4.2
4.1	4.3	5.4	5.6	5.7	5.0	6.2	6.8	5.6	5.2	5.6	6.9	6.6	6.9	6.6	6.0	5.7	5.2	5.1	4.7	5.4	6.6	6.5	5.9	5.4	5.3	4.4	4.3	4.5	4.5	4.7	4.5	4.8	5.4	4.8	4.4
4.0	3.9	4.4	4.1	4.2	4.6	4.1	4.1	4.0	3.9	4.7	4.9	4.9	5.0	4.8	4.4	4.1	3.5	3.3	3.3	3.6	4.2	5.0	4.8	4.8	4.7	4.5	4.2	4.1	4.5	4.9	4.8	4.5	4.4	3.8	4.3
3.4	3.3	3.2	3.1	3.1	3.2	3.5	3.5	3.4	3.1	3.5	4.5	4.0	2.9	2.5	2.5	2.2	2.2	2.1	2.3	2.4	2.8	3.1	3.0	3.0	3.2	2.9	2.7	2.9	3.3	3.8	4.1	4.2	4.2	3.5	3.5
1.6	1.9	2.3	2.5	2.8	3.2	3.3	3.6	3.6	3.3	4.0	3.8	3.3	2.9	2.4	1.9	1.9	1.6	1.3	1.4	1.7	1.6	1.3	.8	1.2	1.6	1.2	.8	.8	1.2	1.1	.9	1.0	1.5	2.1	1.7
1.8	1.8	2.1	2.3	2.6	2.9	2.8	2.5	1.8	1.2	1.6	1.8	2.0	1.6	1.0	.8	.7	.7	.8	.7	.7	.7	.8	.9	.9	.9	.8	.9	1.1	1.2	1.4	1.5	1.8	2.4	2.4	2.0

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

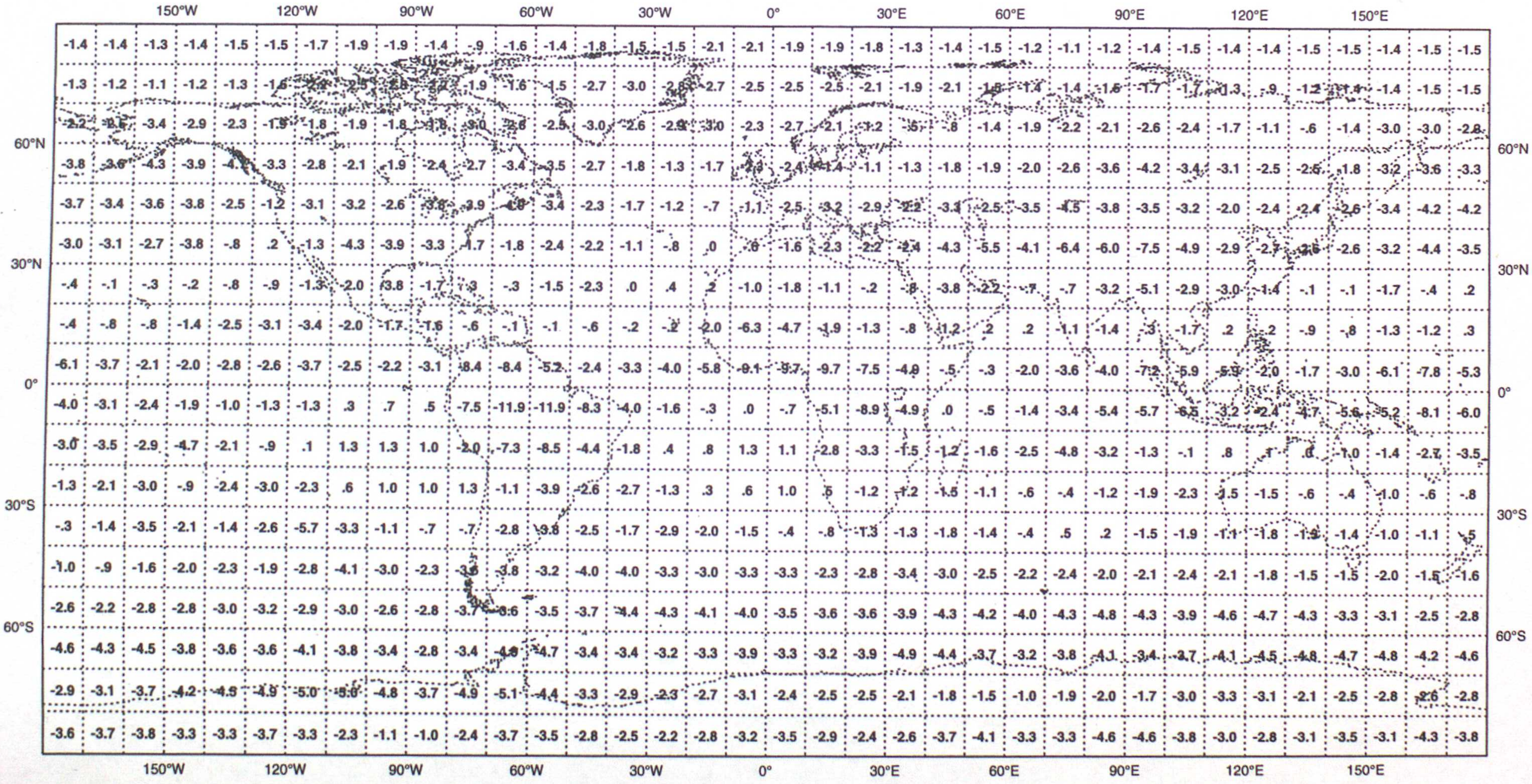
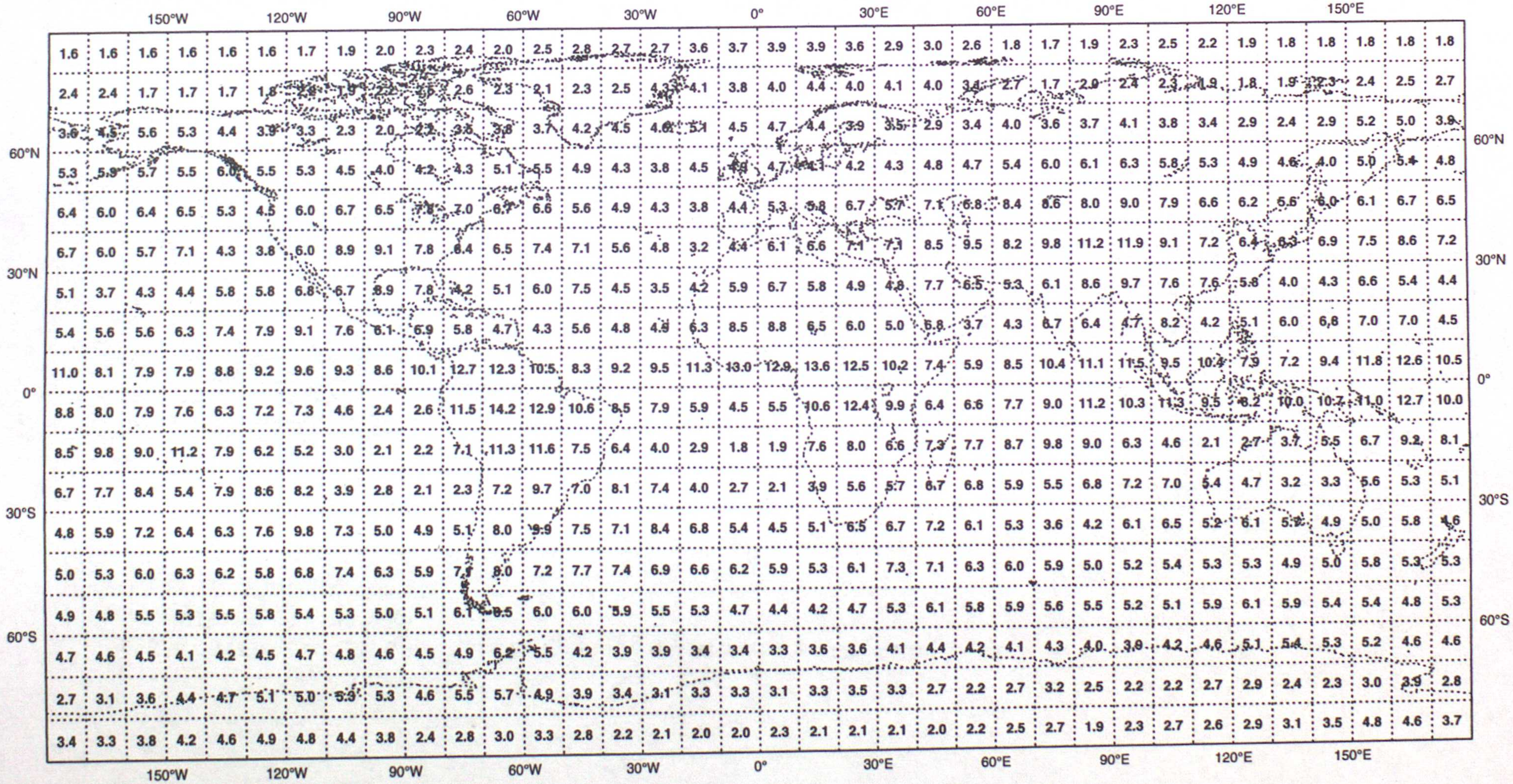
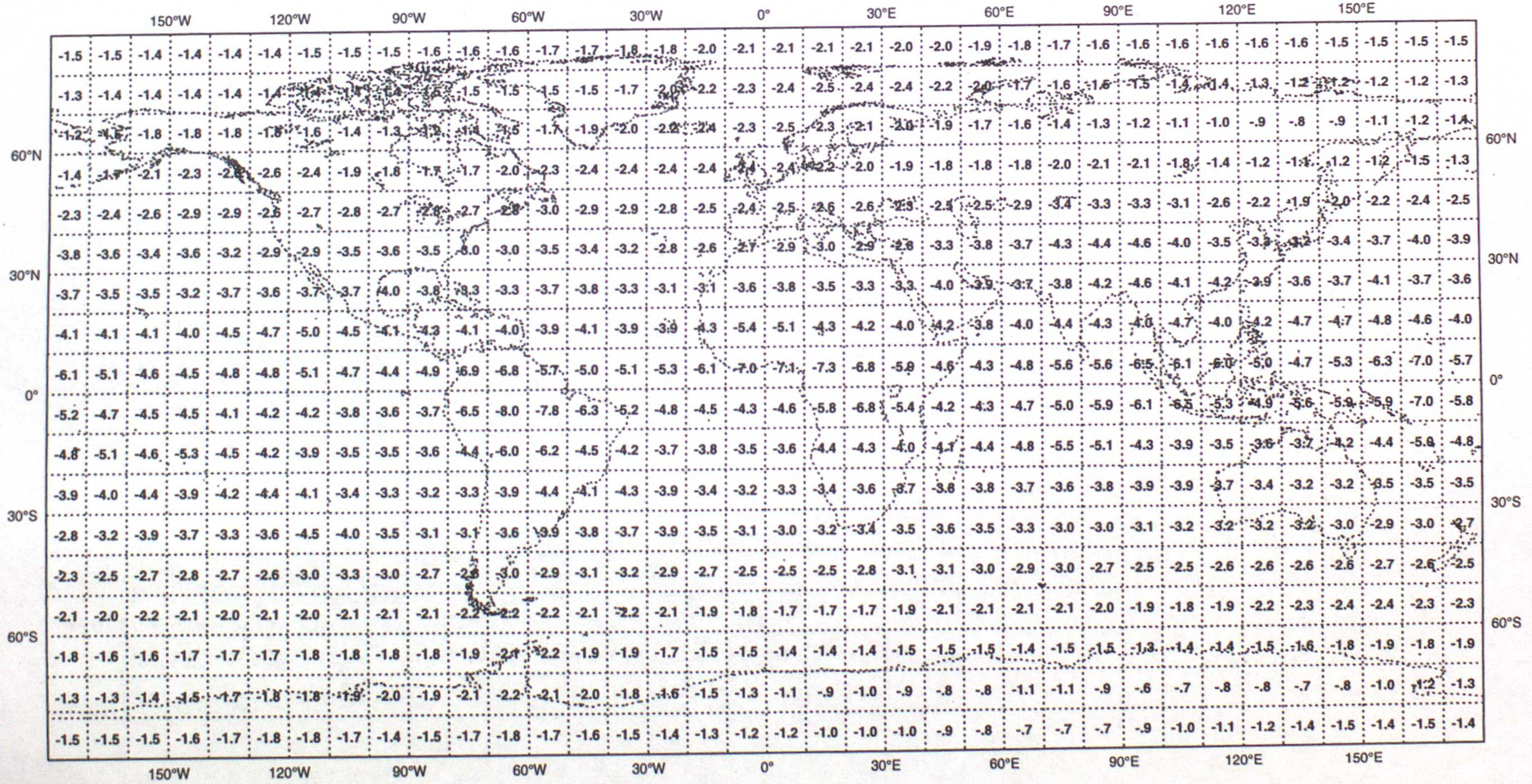

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.9	2.0	2.3	2.4	2.0	2.5	2.8	2.7	2.7	3.6	3.7	3.9	3.9	3.6	2.9	3.0	2.6	1.8	1.7	1.9	2.3	2.5	2.2	1.9	1.8	1.8	1.8	1.8	1.8
2.4	2.4	1.7	1.7	1.7	1.8	2.8	1.9	2.2	2.5	2.6	2.3	2.1	2.3	2.5	4.3	4.1	3.8	4.0	4.4	4.0	4.1	4.0	3.4	2.7	1.7	2.9	2.4	2.3	1.9	1.8	1.9	2.3	2.4	2.5	2.7
3.6	4.5	5.6	5.3	4.4	3.9	3.3	2.3	2.0	2.2	3.5	3.8	3.7	4.2	4.5	4.6	5.1	4.5	4.7	4.4	3.9	3.5	2.9	3.4	4.0	3.6	3.7	4.1	3.8	3.4	2.9	2.4	2.9	5.2	5.0	3.8
5.3	5.9	5.7	5.5	6.0	5.5	5.3	4.5	4.0	4.2	4.3	5.1	5.5	4.9	4.3	3.8	4.5	4.9	4.7	4.1	4.2	4.3	4.8	4.7	5.4	6.0	6.1	6.3	5.8	5.3	4.9	4.6	4.0	5.0	5.4	4.8
6.4	6.0	6.4	6.5	5.3	4.5	6.0	6.7	6.5	7.8	7.0	6.7	6.6	5.6	4.9	4.3	3.8	4.4	5.3	5.8	6.7	5.7	7.1	6.8	8.4	8.6	8.0	9.0	7.9	6.6	6.2	5.6	6.0	6.1	6.7	6.5
6.7	6.0	5.7	7.1	4.3	3.8	6.0	8.9	9.1	7.8	6.4	6.5	7.4	7.1	5.6	4.8	3.2	4.4	6.1	6.6	7.1	7.1	8.5	9.5	8.2	9.8	11.2	11.9	9.1	7.2	6.4	6.3	6.9	7.5	8.6	7.2
5.1	3.7	4.3	4.4	5.8	5.8	6.8	6.7	8.9	7.8	4.2	5.1	6.0	7.5	4.5	3.5	4.2	5.9	6.7	5.8	4.9	4.8	7.7	6.5	5.3	6.1	8.6	9.7	7.6	7.6	5.8	4.0	4.3	6.6	5.4	4.4
5.4	5.6	5.6	6.3	7.4	7.9	9.1	7.6	6.1	6.9	5.8	4.7	4.3	5.6	4.8	4.9	6.3	8.5	8.8	6.5	6.0	5.0	5.8	3.7	4.3	6.7	6.4	4.7	8.2	4.2	5.1	6.0	6.8	7.0	7.0	4.5
11.0	8.1	7.9	7.9	8.8	9.2	9.6	9.3	8.6	10.1	12.7	12.3	10.5	8.3	9.2	9.5	11.3	13.0	12.9	13.6	12.5	10.2	7.4	5.9	8.5	10.4	11.1	11.5	9.5	10.4	7.9	7.2	9.4	11.8	12.6	10.5
8.8	8.0	7.9	7.6	6.3	7.2	7.3	4.6	2.4	2.6	11.5	14.2	12.9	10.6	8.5	7.9	5.9	4.5	5.5	10.6	12.4	9.9	6.4	6.6	7.7	9.0	11.2	10.3	11.3	9.5	8.2	10.0	10.7	11.0	12.7	10.0
8.5	9.8	9.0	11.2	7.9	6.2	5.2	3.0	2.1	2.2	7.1	11.3	11.6	7.5	6.4	4.0	2.9	1.8	1.9	7.6	8.0	6.6	7.3	7.7	8.7	9.8	9.0	6.3	4.6	2.1	2.7	3.7	5.5	6.7	9.2	8.1
6.7	7.7	8.4	5.4	7.9	8.6	8.2	3.9	2.8	2.1	2.3	7.2	9.7	7.0	8.1	7.4	4.0	2.7	2.1	3.9	5.6	5.7	6.7	6.8	5.9	5.5	6.8	7.2	7.0	5.4	4.7	3.2	3.3	5.6	5.3	5.1
4.8	5.9	7.2	6.4	6.3	7.6	9.8	7.3	5.0	4.9	5.1	8.0	9.9	7.5	7.1	8.4	6.8	5.4	4.5	5.1	6.5	6.7	7.2	6.1	5.3	3.6	4.2	6.1	6.5	5.2	6.1	5.2	4.9	5.0	5.8	4.6
5.0	5.3	6.0	6.3	6.2	5.8	6.8	7.4	6.3	5.9	7.1	8.0	7.2	7.7	7.4	6.9	6.6	6.2	5.9	5.3	6.1	7.3	7.1	6.3	6.0	5.9	5.0	5.2	5.4	5.3	5.3	4.9	5.0	5.8	5.3	5.3
4.9	4.8	5.5	5.3	5.5	5.8	5.4	5.3	5.0	5.1	6.1	6.5	6.0	6.0	5.9	5.5	5.3	4.7	4.4	4.2	4.7	5.3	6.1	5.8	5.9	5.6	5.5	5.2	5.1	5.9	6.1	5.9	5.4	5.4	4.8	5.3
4.7	4.6	4.5	4.1	4.2	4.5	4.7	4.8	4.6	4.5	4.9	6.2	5.5	4.2	3.9	3.9	3.4	3.4	3.3	3.6	3.6	4.1	4.4	4.2	4.1	4.3	4.0	3.9	4.2	4.6	5.1	5.4	5.3	5.2	4.6	4.6
2.7	3.1	3.6	4.4	4.7	5.1	5.0	5.3	5.3	4.6	5.5	5.7	4.9	3.9	3.4	3.1	3.3	3.3	3.1	3.3	3.5	3.3	2.7	2.2	2.7	3.2	2.5	2.2	2.2	2.7	2.9	2.4	2.3	3.0	3.9	2.8
3.4	3.3	3.8	4.2	4.6	4.9	4.8	4.4	3.8	2.4	2.8	3.0	3.3	2.8	2.2	2.1	2.0	2.0	2.3	2.1	2.1	2.1	2.0	2.2	2.5	2.7	1.9	2.3	2.7	2.6	2.9	3.1	3.5	4.8	4.6	3.7

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



-1.5	-1.5	-1.4	-1.4	-1.4	-1.4	-1.5	-1.5	-1.5	-1.6	-1.6	-1.6	-1.7	-1.7	-1.8	-1.8	-2.0	-2.1	-2.1	-2.1	-2.1	-2.0	-2.0	-1.9	-1.8	-1.7	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.5	-1.5	-1.5	-1.5
-1.3	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.5	-1.5	-1.5	-1.5	-1.5	-1.7	-2.0	-2.2	-2.3	-2.4	-2.5	-2.4	-2.4	-2.2	-2.0	-1.7	-1.6	-1.6	-1.5	-1.4	-1.4	-1.3	-1.2	-1.2	-1.2	-1.2	-1.3
-1.2	-1.6	-1.8	-1.8	-1.8	-1.8	-1.6	-1.4	-1.3	-1.2	-1.4	-1.5	-1.7	-1.9	-2.0	-2.2	-2.4	-2.3	-2.5	-2.3	-2.1	-2.0	-1.9	-1.7	-1.6	-1.4	-1.3	-1.2	-1.1	-1.0	-.9	-.8	-.9	-1.1	-1.2	-1.4
-1.4	-1.7	-2.1	-2.3	-2.8	-2.6	-2.4	-1.9	-1.8	-1.7	-1.7	-2.0	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.2	-2.0	-1.9	-1.8	-1.8	-1.8	-2.0	-2.1	-2.1	-1.8	-1.4	-1.2	-1.1	-1.2	-1.2	-1.5	-1.3
-2.3	-2.4	-2.6	-2.9	-2.9	-2.6	-2.7	-2.8	-2.7	-2.8	-2.7	-2.8	-3.0	-2.9	-2.9	-2.8	-2.5	-2.4	-2.5	-2.6	-2.6	-2.3	-2.5	-2.5	-2.9	-3.4	-3.3	-3.3	-3.1	-2.6	-2.2	-1.9	-2.0	-2.2	-2.4	-2.5
-3.8	-3.6	-3.4	-3.6	-3.2	-2.9	-2.9	-3.5	-3.6	-3.5	-3.0	-3.0	-3.5	-3.4	-3.2	-2.8	-2.6	-2.7	-2.9	-3.0	-2.9	-2.8	-3.3	-3.8	-3.7	-4.3	-4.4	-4.6	-4.0	-3.5	-3.3	-3.2	-3.4	-3.7	-4.0	-3.9
-3.7	-3.5	-3.5	-3.2	-3.7	-3.6	-3.7	-3.7	-4.0	-3.8	-3.3	-3.3	-3.7	-3.8	-3.3	-3.1	-3.1	-3.6	-3.8	-3.5	-3.3	-3.3	-4.0	-3.9	-3.7	-3.8	-4.2	-4.6	-4.1	-4.2	-3.9	-3.6	-3.7	-4.1	-3.7	-3.6
-4.1	-4.1	-4.1	-4.0	-4.5	-4.7	-5.0	-4.5	-4.1	-4.3	-4.1	-4.0	-3.9	-4.1	-3.9	-3.9	-4.3	-5.4	-5.1	-4.3	-4.2	-4.0	-4.2	-3.8	-4.0	-4.4	-4.3	-4.0	-4.7	-4.0	-4.2	-4.7	-4.7	-4.8	-4.6	-4.0
-6.1	-5.1	-4.6	-4.5	-4.8	-4.8	-5.1	-4.7	-4.4	-4.9	-6.9	-6.8	-5.7	-5.0	-5.1	-5.3	-6.1	-7.0	-7.1	-7.3	-6.8	-5.9	-4.6	-4.3	-4.8	-5.6	-5.6	-6.5	-6.1	-6.0	-5.0	-4.7	-5.3	-6.3	-7.0	-5.7
-5.2	-4.7	-4.5	-4.5	-4.1	-4.2	-4.2	-3.8	-3.6	-3.7	-6.5	-8.0	-7.8	-6.3	-5.2	-4.8	-4.5	-4.3	-4.6	-5.8	-6.8	-5.4	-4.2	-4.3	-4.7	-5.0	-5.9	-6.1	-6.5	-5.3	-4.9	-5.6	-5.9	-5.9	-7.0	-5.8
-4.8	-5.1	-4.6	-5.3	-4.5	-4.2	-3.9	-3.5	-3.5	-3.6	-4.4	-6.0	-6.2	-4.5	-4.2	-3.7	-3.8	-3.5	-3.6	-4.4	-4.3	-4.0	-4.1	-4.4	-4.8	-5.5	-5.1	-4.3	-3.9	-3.5	-3.6	-3.7	-4.2	-4.4	-5.9	-4.8
-3.9	-4.0	-4.4	-3.9	-4.2	-4.4	-4.1	-3.4	-3.3	-3.2	-3.3	-3.9	-4.4	-4.1	-4.3	-3.9	-3.4	-3.2	-3.3	-3.4	-3.6	-3.7	-3.8	-3.8	-3.7	-3.6	-3.8	-3.9	-3.9	-3.7	-3.4	-3.2	-3.2	-3.5	-3.5	-3.5
-2.8	-3.2	-3.9	-3.7	-3.3	-3.6	-4.5	-4.0	-3.5	-3.1	-3.1	-3.6	-3.9	-3.8	-3.7	-3.9	-3.5	-3.1	-3.0	-3.2	-3.4	-3.5	-3.6	-3.5	-3.3	-3.0	-3.0	-3.1	-3.2	-3.2	-3.2	-3.2	-3.0	-2.9	-3.0	-2.7
-2.3	-2.5	-2.7	-2.8	-2.7	-2.6	-3.0	-3.3	-3.0	-2.7	-2.8	-3.0	-2.9	-3.1	-3.2	-2.9	-2.7	-2.5	-2.5	-2.5	-2.8	-3.1	-3.1	-3.0	-2.9	-3.0	-2.7	-2.5	-2.5	-2.6	-2.6	-2.6	-2.6	-2.7	-2.6	-2.5
-2.1	-2.0	-2.2	-2.1	-2.0	-2.1	-2.0	-2.1	-2.1	-2.1	-2.2	-2.2	-2.2	-2.1	-2.2	-2.1	-1.9	-1.8	-1.7	-1.7	-1.7	-1.9	-2.1	-2.1	-2.1	-2.1	-2.0	-1.9	-1.8	-1.9	-2.2	-2.3	-2.4	-2.4	-2.3	-2.3
-1.8	-1.6	-1.6	-1.7	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	-1.9	-2.1	-2.2	-1.9	-1.9	-1.7	-1.5	-1.5	-1.4	-1.4	-1.4	-1.5	-1.5	-1.5	-1.4	-1.5	-1.5	-1.3	-1.4	-1.4	-1.5	-1.6	-1.8	-1.9	-1.8	-1.9
-1.3	-1.3	-1.4	-1.5	-1.7	-1.8	-1.8	-1.9	-2.0	-1.9	-2.1	-2.2	-2.1	-2.0	-1.8	-1.6	-1.5	-1.3	-1.1	-.9	-1.0	-.9	-.8	-.8	-1.1	-1.1	-.9	-.6	-.7	-.8	-.8	-.7	-.8	-1.0	-1.2	-1.3
-1.5	-1.5	-1.5	-1.6	-1.7	-1.8	-1.8	-1.7	-1.4	-1.5	-1.7	-1.8	-1.7	-1.6	-1.5	-1.4	-1.3	-1.2	-1.2	-1.0	-1.0	-1.0	-.9	-.8	-.7	-.7	-.7	-.9	-1.0	-1.1	-1.2	-1.4	-1.5	-1.4	-1.5	-1.4

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

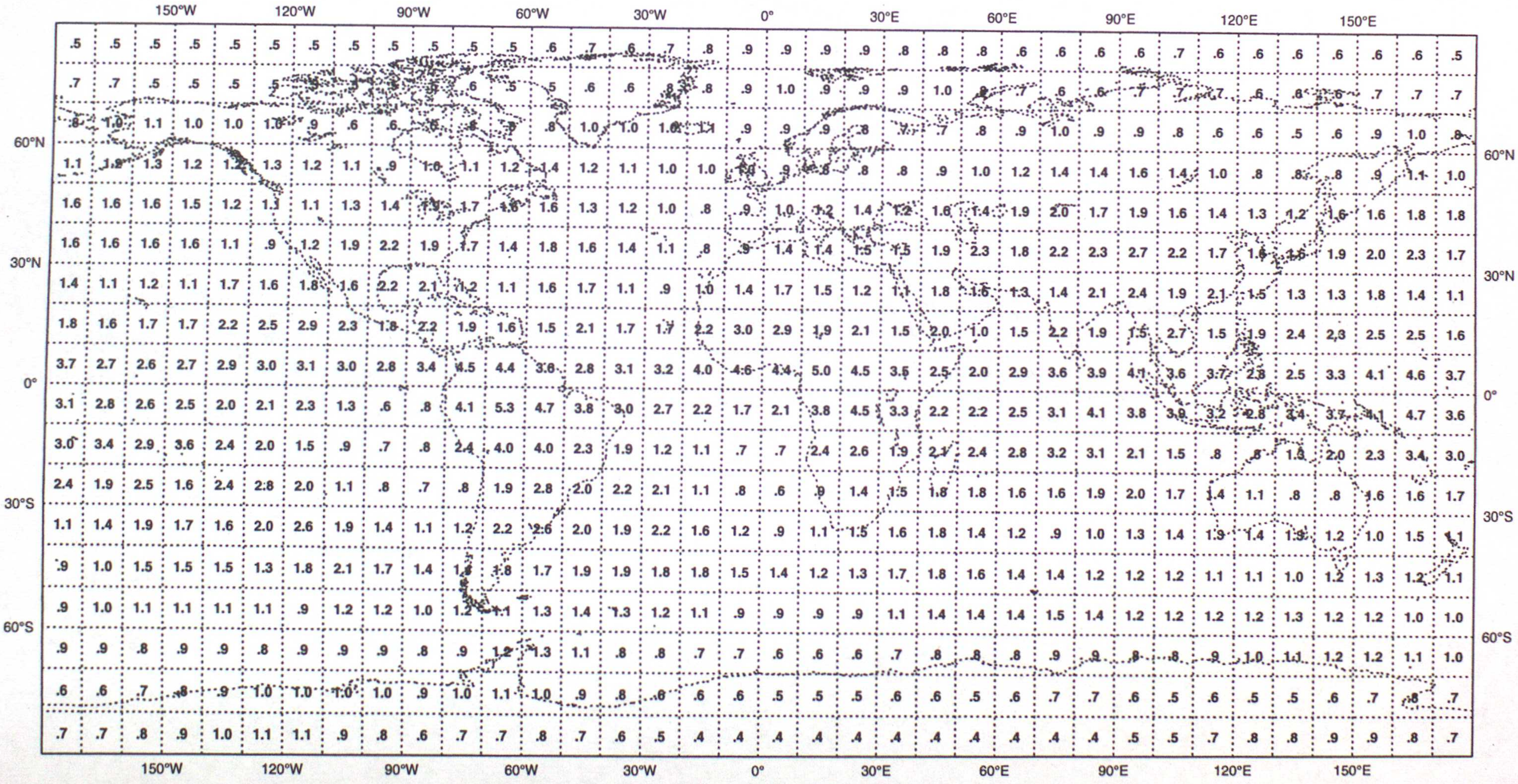

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .7 .6 .7 .8 .9 .9 .9 .9 .8 .8 .8 .6 .6 .6 .6 .7 .6 .6 .6 .6 .6 .6 .5
.7 .7 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .6 .6 .8 .8 .9 1.0 .9 .9 .9 1.0 .8 .7 .6 .6 .7 .7 .7 .6 .8 .6 .7 .7 .7
.8 1.0 1.1 1.0 1.0 1.0 .9 .6 .6 .6 .8 .8 .8 1.0 1.0 1.6 1.1 .9 .9 .9 .8 .7 .7 .8 .9 1.0 .9 .9 .8 .6 .6 .5 .6 .9 1.0 .8
1.1 1.2 1.3 1.2 1.2 1.3 1.2 1.1 .9 1.0 1.1 1.2 1.4 1.2 1.1 1.0 1.0 1.0 .9 .8 .8 .8 .9 1.0 1.2 1.4 1.4 1.6 1.4 1.0 .8 .8 .8 .9 1.1 1.0
1.6 1.6 1.6 1.5 1.2 1.1 1.1 1.3 1.4 1.9 1.7 1.6 1.6 1.3 1.2 1.0 .8 .9 1.0 1.2 1.4 1.2 1.6 1.4 1.9 2.0 1.7 1.9 1.6 1.4 1.3 1.2 1.6 1.6 1.8 1.8
1.6 1.6 1.6 1.6 1.1 .9 1.2 1.9 2.2 1.9 1.7 1.4 1.8 1.6 1.4 1.1 .8 .9 1.4 1.4 1.5 1.5 1.9 2.3 1.8 2.2 2.3 2.7 2.2 1.7 1.6 1.6 1.9 2.0 2.3 1.7
1.4 1.1 1.2 1.1 1.7 1.6 1.8 1.6 2.2 2.1 1.2 1.1 1.6 1.7 1.1 .9 1.0 1.4 1.7 1.5 1.2 1.1 1.8 1.6 1.3 1.4 2.1 2.4 1.9 2.1 1.5 1.3 1.3 1.8 1.4 1.1
1.8 1.6 1.7 1.7 2.2 2.5 2.9 2.3 1.8 2.2 1.9 1.6 1.5 2.1 1.7 1.7 2.2 3.0 2.9 1.9 2.1 1.5 2.0 1.0 1.5 2.2 1.9 1.5 2.7 1.5 1.9 2.4 2.3 2.5 2.5 1.6
3.7 2.7 2.6 2.7 2.9 3.0 3.1 3.0 2.8 3.4 4.5 4.4 3.6 2.8 3.1 3.2 4.0 4.6 4.4 5.0 4.5 3.5 2.5 2.0 2.9 3.6 3.9 4.1 3.6 3.7 2.8 2.5 3.3 4.1 4.6 3.7
3.1 2.8 2.6 2.5 2.0 2.1 2.3 1.3 .6 .8 4.1 5.3 4.7 3.8 3.0 2.7 2.2 1.7 2.1 3.8 4.5 3.3 2.2 2.2 2.5 3.1 4.1 3.8 3.9 3.2 2.8 3.4 3.7 4.1 4.7 3.6
3.0 3.4 2.9 3.6 2.4 2.0 1.5 .9 .7 .8 2.4 4.0 4.0 2.3 1.9 1.2 1.1 .7 .7 2.4 2.6 1.9 2.1 2.4 2.8 3.2 3.1 2.1 1.5 .8 .8 1.3 2.0 2.3 3.4 3.0
2.4 1.9 2.5 1.6 2.4 2.8 2.0 1.1 .8 .7 .8 1.9 2.8 2.0 2.2 2.1 1.1 .8 .6 .9 1.4 1.5 1.8 1.8 1.6 1.6 1.9 2.0 1.7 1.4 1.1 .8 .8 1.6 1.6 1.7
1.1 1.4 1.9 1.7 1.6 2.0 2.6 1.9 1.4 1.1 1.2 2.2 2.6 2.0 1.9 2.2 1.6 1.2 .9 1.1 1.5 1.6 1.8 1.4 1.2 .9 1.0 1.3 1.4 1.9 1.4 1.9 1.2 1.0 1.5 1.1
.9 1.0 1.5 1.5 1.5 1.3 1.8 2.1 1.7 1.4 1.4 1.8 1.7 1.9 1.9 1.8 1.8 1.5 1.4 1.2 1.3 1.7 1.8 1.6 1.4 1.4 1.2 1.2 1.2 1.1 1.1 1.0 1.2 1.3 1.2 1.1
.9 1.0 1.1 1.1 1.1 1.1 .9 1.2 1.2 1.0 1.2 1.1 1.3 1.4 1.3 1.2 1.1 .9 .9 .9 .9 1.1 1.4 1.4 1.4 1.5 1.4 1.2 1.2 1.2 1.2 1.3 1.2 1.2 1.0 1.0
.9 .9 .8 .9 .9 .8 .9 .9 .9 .8 .9 1.2 1.3 1.1 .8 .8 .7 .7 .6 .6 .6 .7 .8 .8 .8 .9 .9 .8 .8 .9 1.0 1.1 1.2 1.2 1.1 1.0
.6 .6 .7 .8 .9 1.0 1.0 1.0 1.0 .9 1.0 1.1 1.0 .9 .8 .6 .6 .6 .5 .5 .5 .6 .6 .5 .6 .7 .7 .6 .5 .6 .5 .5 .6 .7 .8 .7
.7 .7 .8 .9 1.0 1.1 1.1 .9 .8 .6 .7 .7 .8 .7 .6 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .7 .8 .8 .9 .9 .8 .7

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

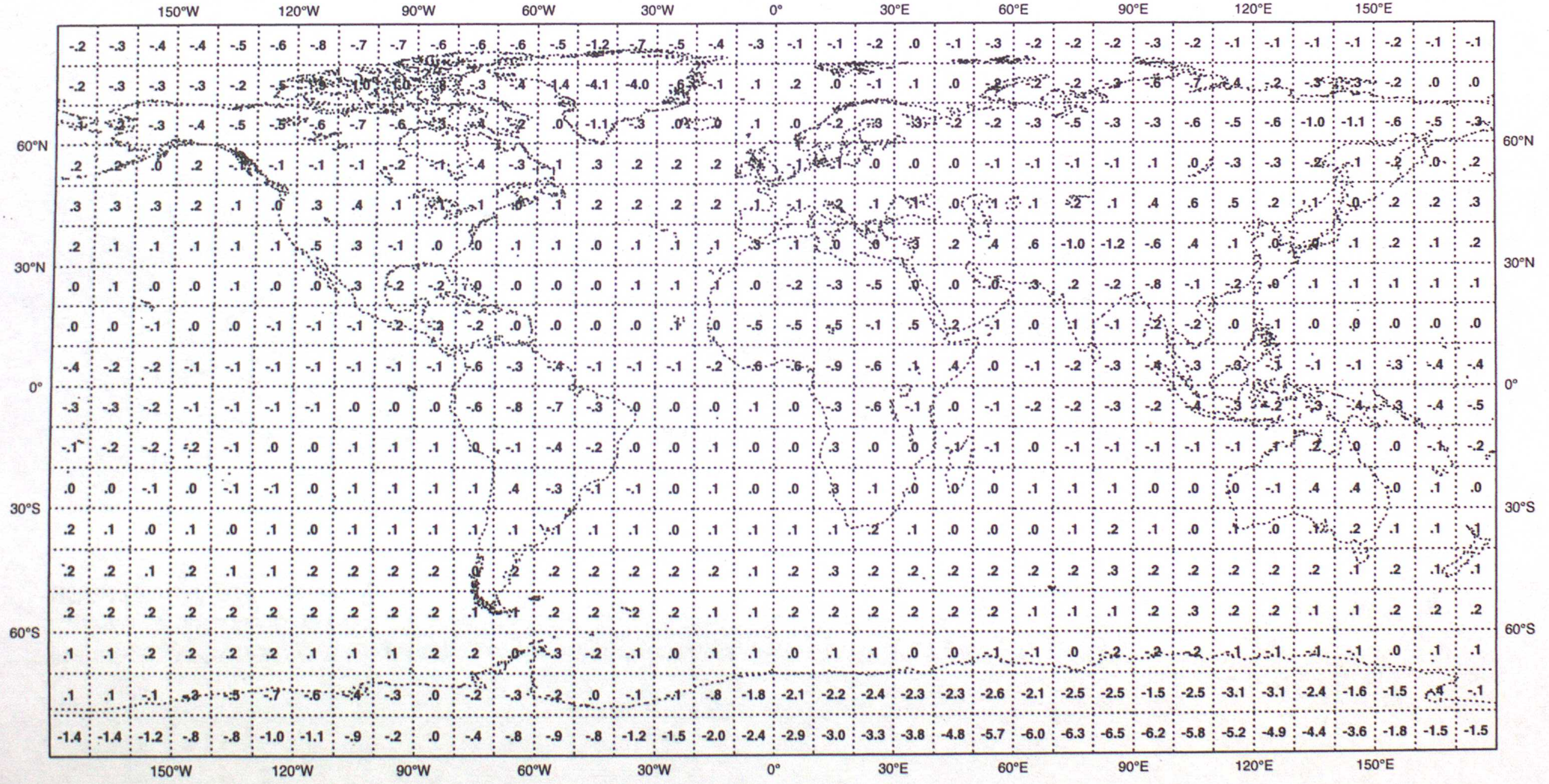

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

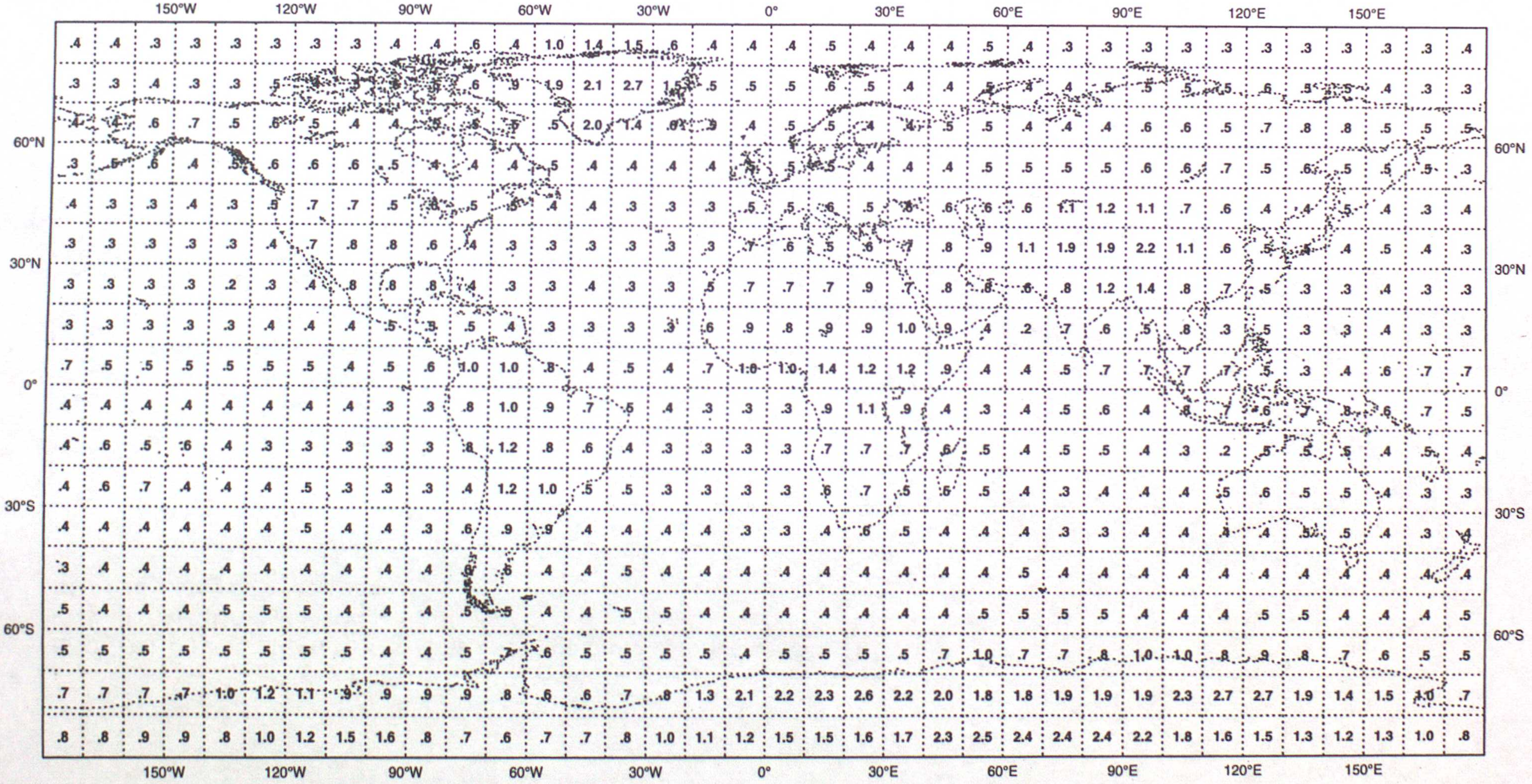
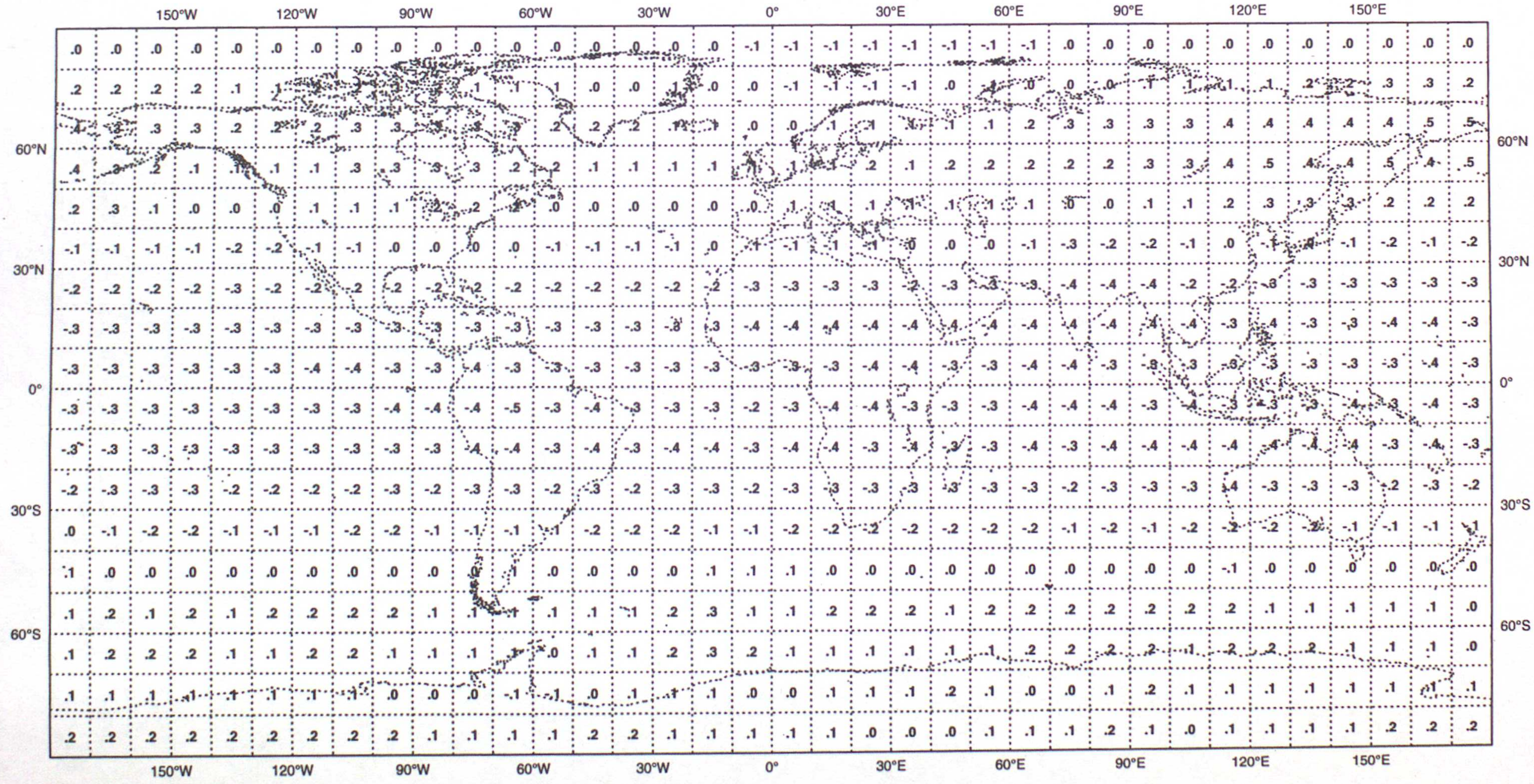

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .6 .4 1.0 1.4 1.5 .6 .4 .4 .4 .5 .4 .4 .4 .5 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.3 .3 .4 .3 .3 .5 .4 .5 .6 .5 .6 .9 1.9 2.1 2.7 1.5 .5 .5 .5 .6 .5 .4 .4 .5 .4 .4 .5 .5 .5 .5 .6 .5 .5 .4 .3 .3
.4 .4 .6 .7 .5 .6 .5 .4 .4 .5 .5 .5 .5 2.0 1.4 .6 .9 .4 .5 .5 .4 .4 .5 .5 .4 .4 .4 .6 .6 .5 .7 .8 .8 .5 .5 .5
.3 .5 .6 .4 .5 .6 .6 .6 .5 .4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .6 .6 .7 .5 .6 .5 .5 .5 .3
.4 .3 .3 .4 .3 .5 .7 .7 .5 .6 .5 .5 .4 .4 .3 .3 .3 .5 .5 .6 .5 .6 .6 .6 .6 1.1 1.2 1.1 .7 .6 .4 .4 .5 .4 .3 .4
.3 .3 .3 .3 .3 .4 .7 .8 .8 .6 .4 .3 .3 .3 .3 .3 .3 .7 .6 .5 .6 .7 .8 .9 1.1 1.9 1.9 2.2 1.1 .6 .5 .5 .4 .5 .4 .3
.3 .3 .3 .3 .2 .3 .4 .8 .8 .8 .4 .3 .3 .4 .3 .3 .5 .7 .7 .7 .9 .7 .8 .8 .6 .8 1.2 1.4 .8 .7 .5 .3 .3 .4 .3 .3
.3 .3 .3 .3 .3 .4 .4 .4 .5 .3 .5 .4 .3 .3 .3 .3 .6 .9 .8 .9 .9 1.0 .9 .4 .2 .7 .6 .5 .8 .3 .5 .3 .3 .4 .3 .3
.7 .5 .5 .5 .5 .5 .5 .4 .5 .6 1.0 1.0 .8 .4 .5 .4 .7 1.0 1.0 1.4 1.2 1.2 .9 .4 .4 .5 .7 .7 .7 .7 .5 .3 .4 .6 .7 .7
.4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .8 1.0 .9 .7 .5 .4 .3 .3 .3 .9 1.1 .9 .4 .3 .4 .5 .6 .4 .8 .7 .6 .7 .8 .6 .7 .5
.4 .6 .5 .6 .4 .3 .3 .3 .3 .3 .8 1.2 .8 .6 .4 .3 .3 .3 .3 .7 .7 .7 .6 .5 .4 .5 .5 .4 .3 .2 .5 .5 .5 .4 .5 .4
.4 .6 .7 .4 .4 .4 .5 .3 .3 .3 .4 1.2 1.0 .5 .5 .3 .3 .3 .3 .6 .7 .5 .6 .5 .4 .3 .4 .4 .4 .5 .6 .5 .5 .4 .3 .3
.4 .4 .4 .4 .4 .4 .5 .4 .4 .3 .6 .9 .9 .4 .4 .4 .4 .3 .3 .4 .6 .5 .4 .4 .4 .3 .3 .4 .4 .4 .4 .5 .5 .4 .3 .4
.3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .6 .6 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .4 .4 .4 .5 .5 .5 .4 .4 .4 .5 .5 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5 .4 .4 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .7 .6 .5 .5 .5 .5 .4 .5 .5 .5 .5 .7 1.0 .7 .7 .8 1.0 1.0 .8 .9 .8 .7 .6 .5 .5
.7 .7 .7 .7 1.0 1.2 1.1 .9 .9 .9 .9 .8 .6 .6 .7 .8 1.3 2.1 2.2 2.3 2.6 2.2 2.0 1.8 1.8 1.9 1.9 1.9 2.3 2.7 2.7 1.9 1.4 1.5 1.0 .7
.8 .8 .9 .9 .8 1.0 1.2 1.5 1.6 .8 .7 .6 .7 .7 .8 1.0 1.1 1.2 1.5 1.5 1.6 1.7 2.3 2.5 2.4 2.4 2.4 2.2 1.8 1.6 1.5 1.3 1.2 1.3 1.0 .8

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

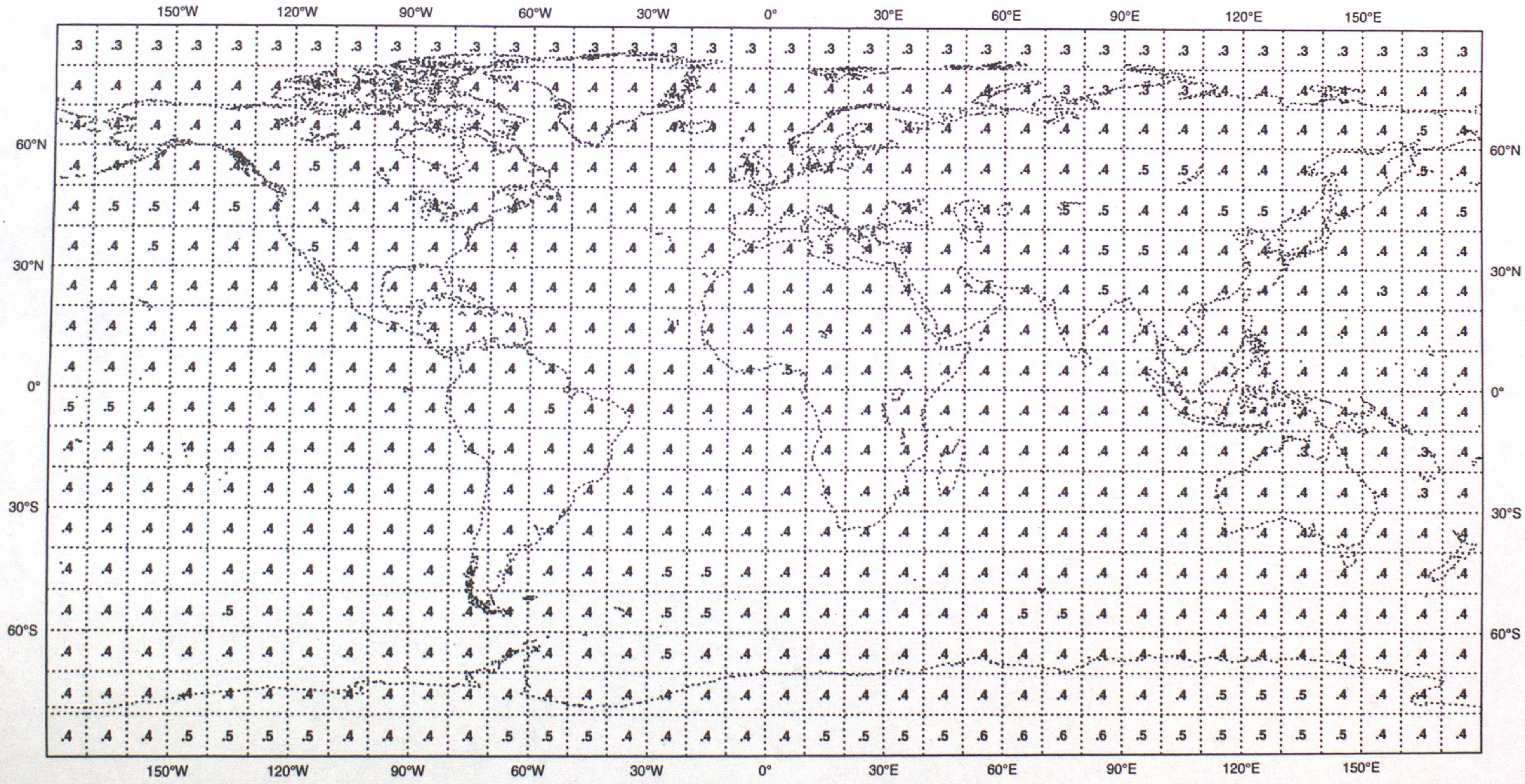

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

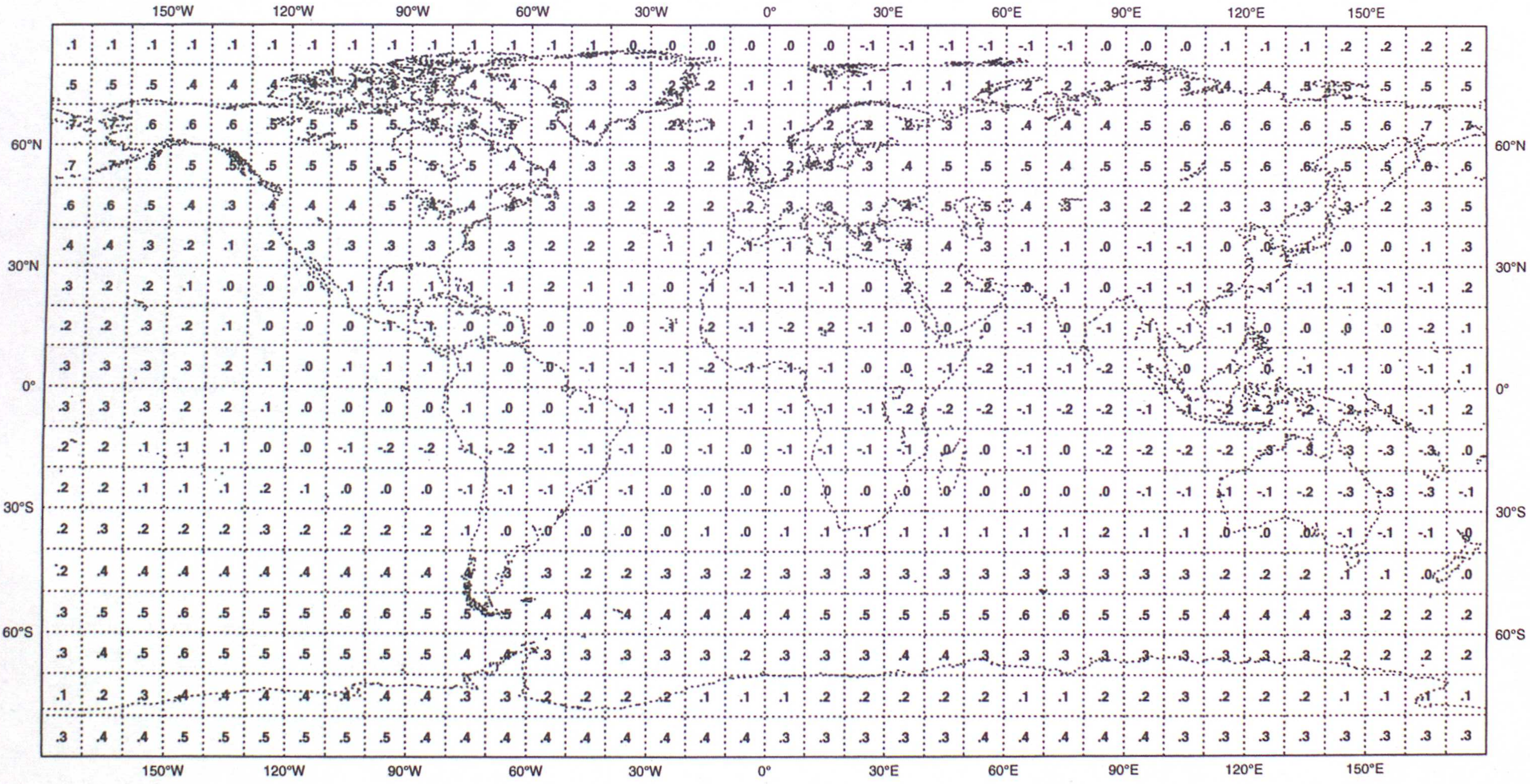

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 .1 .1 .1 .2 .2 .2 .2
.5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .2 .2 .1 .1 .1 .1 .1 .1 .1 .2 .2 .3 .3 .3 .4 .4 .5 .5 .5 .5 .5
.7 .7 .6 .6 .6 .5 .5 .5 .5 .5 .6 .5 .5 .4 .3 .2 .1 .1 .1 .2 .2 .2 .3 .3 .4 .4 .4 .5 .6 .6 .6 .6 .5 .6 .7 .7
.7 .7 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .3 .3 .3 .2 .2 .2 .3 .3 .4 .5 .5 .5 .4 .5 .5 .5 .5 .6 .6 .5 .5 .6 .6
.6 .6 .5 .4 .3 .4 .4 .4 .5 .4 .4 .4 .3 .3 .2 .2 .2 .2 .3 .3 .3 .4 .5 .5 .4 .3 .3 .2 .2 .3 .3 .3 .3 .2 .3 .5
.4 .4 .3 .2 .1 .2 .3 .3 .3 .3 .3 .3 .2 .2 .2 .1 .1 .1 .1 .1 .2 .4 .4 .3 .1 .1 .0 -.1 -.1 .0 .0 .1 .0 .0 .1 .3
.3 .2 .2 .1 .0 .0 .0 .1 .1 .1 .1 .1 .2 .1 .1 .0 -.1 -.1 -.1 -.1 .0 .2 .2 .2 .0 .1 .0 -.1 -.1 -.2 -.1 -.1 -.1 -.1 -.1 .2
.2 .2 .3 .2 .1 .0 .0 .0 .1 .1 .0 .0 .0 .0 .0 -.1 .2 -.1 -.2 -.2 -.1 .0 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 .0 .0 .0 .0 -.2 .1
.3 .3 .3 .3 .2 .1 .0 .1 .1 .1 .1 .0 .0 -.1 -.1 -.1 -.2 -.1 -.1 -.1 .0 .0 -.1 -.2 -.1 -.1 -.2 -.1 .0 -.1 .0 -.1 -.1 .0 -.1 .1
.3 .3 .3 .2 .2 .1 .0 .0 .0 .0 .1 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.1 -.2 -.2 -.1 -.1 -.2 -.2 -.2 -.2 -.1 -.1 .2
.2 .2 .1 .1 .1 .0 .0 -.1 -.2 -.2 -.1 -.2 -.1 -.1 -.1 .0 -.1 .0 -.1 -.1 -.1 -.1 .0 .0 -.1 .0 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.3 -.3 .0
.2 .2 .1 .1 .1 .2 .1 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 -.1 -.1 .1 -.1 -.2 -.3 -.3 -.3 -.1
.2 .3 .2 .2 .2 .3 .2 .2 .2 .2 .1 .0 .0 .0 .0 .0 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .0 .0 .0 -.1 -.1 -.1 .0
.2 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .2 .2 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .1 .1 .0 .0
.3 .5 .5 .6 .5 .5 .5 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .4 .4 .4 .3 .2 .2 .2
.3 .4 .5 .6 .5 .5 .5 .5 .5 .5 .4 .4 .3 .3 .3 .3 .3 .2 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2
.1 .2 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .2 .2 .2 .2 .1 .1 .1 .2 .2 .2 .2 .2 .1 .1 .2 .2 .3 .2 .2 .2 .1 .1 .1 .1
.3 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

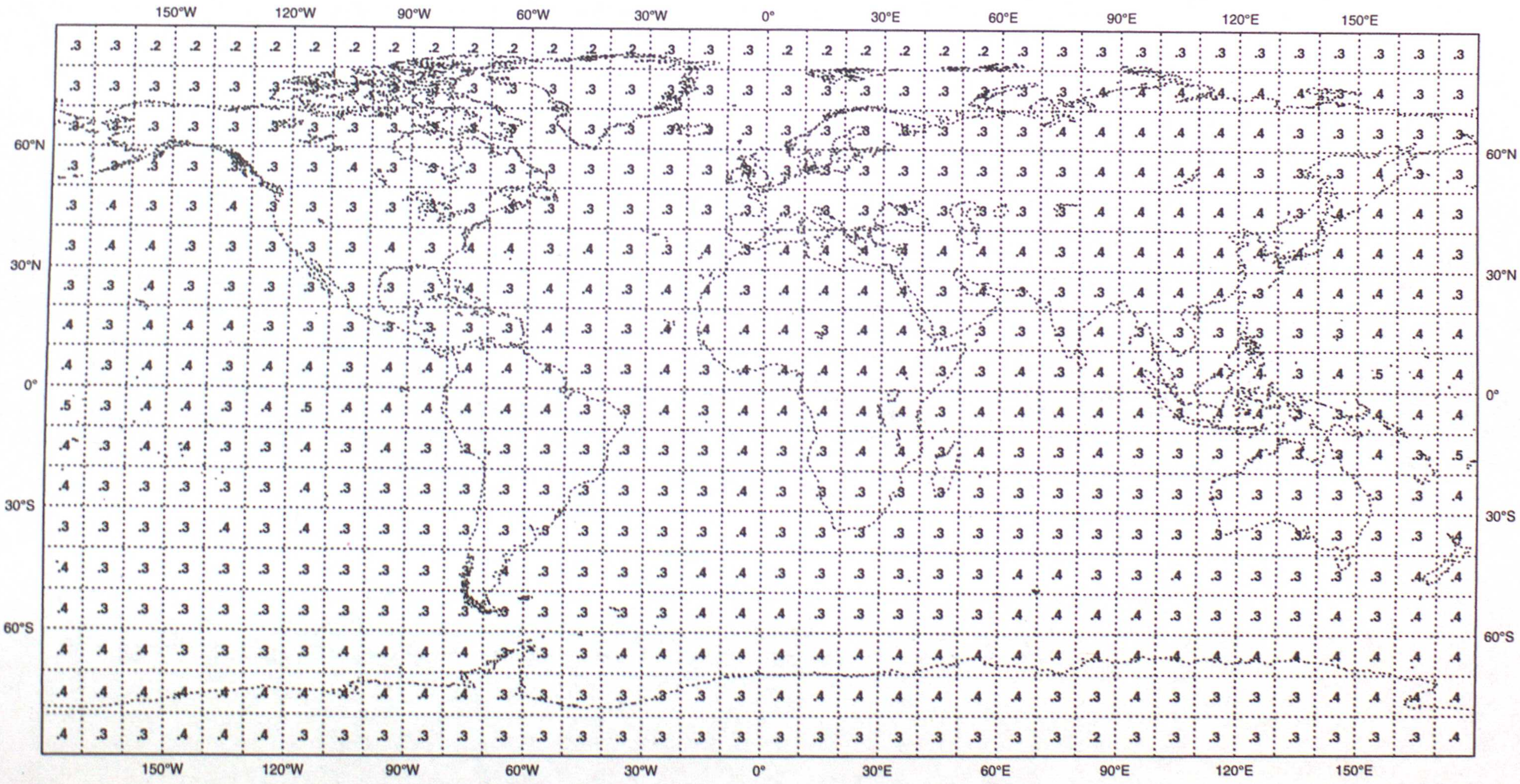

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .4 .3 .3
.3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .3
.3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .4 .4 .3 .4 .4 .4 .4 .3 .4 .3 .3 .3 .4 .4 .4 .3 .4 .4 .4 .4 .3
.4 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4
.4 .3 .4 .4 .3 .4 .4 .3 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .3 .4 .4 .3 .4 .5 .4 .4
.5 .3 .4 .4 .3 .4 .5 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3 .4 .4 .4
.4 .3 .4 .4 .3 .3 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .4 .3 .3 .4 .3 .3 .3 .4 .3 .3 .4 .3 .5
.4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.3 .3 .3 .3 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .4 .4
.4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .3 .3 .3 .4 .4 .4 .4
.4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .4

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures **Period**		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	19.9	-27.6	P	953	0	26	0.5	0.0	0.5
13532	31.4	-13.7	P	699	0	2	0.8	0.5	1.0
13533	17.5	-38.3	P	776	0	8	0.5	0.1	0.5
13600	18.9	-39.6	P	520	0	13	0.5	0.9	1.0
13602	21.2	-39.7	P	426	0	0	0.5	0.2	0.6
41520	11.7	-53.6	P	1011	0	68	0.5	1.6	1.7
41590	23.4	-61.3	P	537	0	0	0.5	0.8	0.9
41594	24.8	-44.9	P	557	0	0	0.5	-0.2	0.5
41595	25.5	-36.5	P	526	0	0	0.5	0.7	0.8
41600	39.5	-62.6	P	598	0	2	1.1	-0.4	1.2
41601	35.9	-71.9	P	469	0	32	0.5	-0.2	0.5
41631	29.3	-71.1	P	444	0	0	0.6	0.1	0.7
41646	24.7	-73.7	P	486	0	1	0.5	0.4	0.7
41655	24.4	-64.9	P	462	0	1	0.5	0.5	0.7
41666	28.4	-50.6	P	572	0	0	0.5	0.8	0.9
44546	51.6	-22.6	P	606	0	2	0.5	-0.2	0.5
44547	56.0	-36.9	P	637	1	3	0.7	-0.2	0.7
44551	55.5	-17.5	P	680	0	2	1.0	0.6	1.2
44603	61.7	-19.4	P	740	0	6	0.9	0.3	1.0
44605	56.1	-9.9	P	737	0	4	0.6	-0.1	0.6
44606	30.1	-57.0	P	716	0	4	0.5	-0.4	0.6
44608	36.6	-35.4	P	383	0	3	0.8	-0.3	0.9
44609	58.9	-10.7	P	687	0	6	0.9	-0.4	1.0
44611	63.7	-3.3	P	703	0	4	0.6	-0.1	0.6
44612	54.1	-22.4	P	592	0	1	0.5	-0.1	0.5
44613	63.5	-13.5	P	948	0	31	0.8	-0.7	1.1
44614	64.7	-28.8	P	696	0	4	0.9	-0.8	1.1
44617	48.0	-44.1	P	606	0	0	0.8	0.4	0.9
44623	29.7	-44.4	P	708	0	3	0.8	-0.2	0.9
44624	47.6	-43.8	P	594	0	1	1.1	0.6	1.3
44625	57.5	-38.1	P	370	0	1	0.8	0.2	0.8
44626	40.7	-56.6	P	592	0	3	1.3	0.5	1.4
44627	46.7	-43.9	P	492	0	0	0.7	-0.2	0.7
44628	34.5	-28.8	P	667	0	3	0.8	-0.6	1.0
44630	30.8	-30.6	P	691	0	3	0.6	0.3	0.7
44742	49.6	-32.6	P	593	0	2	0.8	0.6	0.9
44743	49.5	-29.8	P	591	0	2	0.6	-0.2	0.7
44744	46.9	-29.3	P	733	0	4	1.4	0.0	1.4
44745	51.1	-30.2	P	735	0	3	0.9	0.3	0.9
44747	49.8	-26.1	P	551	0	2	0.5	-0.4	0.7
44761	53.0	-41.3	P	627	0	1	0.8	0.6	1.0
44762	54.0	-39.5	P	873	0	30	1.0	0.8	1.3
44765	39.6	-61.8	P	643	0	13	0.8	-0.5	1.0
44766	49.5	-26.2	P	572	0	1	0.5	0.0	0.5
44771	50.9	-16.8	P	179	2	21	1.5	-0.3	1.5
44772	55.8	-32.1	P	163	52	67	1.6	-0.2	1.6
44773	63.5	-30.6	P	340	0	25	0.8	-0.1	0.8
44777	27.8	-25.7	P	247	0	17	0.5	-0.2	0.5
44778	37.6	-19.3	P	245	0	19	0.4	0.0	0.4
44780	62.4	-21.2	P	618	0	40	0.8	-0.1	0.8
62514	32.5	-26.3	P	706	0	3	0.9	0.3	1.0
62515	20.9	-69.9	P	729	0	2	0.5	0.1	0.5
62517	29.0	-35.6	P	730	0	2	0.5	-0.7	0.9
62551	39.3	-19.3	P	719	0	4	0.5	-0.2	0.5
62552	33.1	-21.3	P	753	0	7	0.5	0.5	0.7
62556	42.8	-14.6	P	407	0	4	0.5	0.1	0.5
62557	43.7	-11.4	P	400	0	3	0.5	0.2	0.5
62558	44.2	-17.2	P	111	0	2	0.5	0.4	0.7
62559	45.7	-13.6	P	113	0	2	0.4	-0.1	0.4
62574	48.2	-8.7	P	389	0	2	0.6	0.5	0.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
62576	46.7	-7.6	P	679	0	3	0.7	0.2	0.7
62694	49.7	-17.8	P	475	0	1	0.5	0.2	0.6
62712	61.0	-12.7	P	694	0	6	0.9	-0.1	0.9
62801	36.5	-19.0	P	645	0	4	0.6	0.3	0.7
62804	45.4	-6.0	P	419	0	16	1.0	-0.3	1.1
64608	61.0	-30.5	P	258	0	3	0.7	-0.5	0.9
65597	50.7	-46.9	P	408	0	26	0.7	-0.2	0.7
65598	56.6	-35.0	P	372	0	26	1.0	-0.5	1.1
65599	55.9	-35.1	P	295	0	24	0.7	-0.4	0.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	18.9	-39.6	SPEED	505	0	100	1.1	-1.4	1.8
13602	21.2	-39.7	SPEED	423	0	100	1.0	-1.0	1.4
41590	23.4	-61.3	SPEED	524	0	100	1.3	-0.4	1.4
41594	24.8	-44.9	SPEED	540	0	100	1.4	-0.9	1.7
41595	25.5	-36.5	SPEED	511	0	100	1.4	-1.0	1.7
44546	51.6	-22.6	SPEED	602	0	100	2.3	0.4	2.3
44551	55.5	-17.5	SPEED	631	0	100	2.3	0.5	2.3
62574	48.2	-8.7	SPEED	261	0	100	1.5	-1.3	2.0

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13600	18.9	-39.6	DIRN.	309	0	0	47.4	23.5	52.9
13602	21.2	-39.7	DIRN.	278	0	0	15.0	-20.1	25.1
41590	23.4	-61.3	DIRN.	145	0	0	19.3	-9.9	21.7
41594	24.8	-44.9	DIRN.	353	0	0	14.1	-4.5	14.8
41595	25.5	-36.5	DIRN.	274	0	0	17.1	-21.0	27.1
44546	51.6	-22.6	DIRN.	466	0	0	21.3	5.1	21.9
44551	55.5	-17.5	DIRN.	556	0	0	17.2	10.3	20.0
62574	48.2	-8.7	DIRN.	216	0	0	12.3	1.9	12.4

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	737	1	9	1.6	0.0	503	0	10	0	6.7	0.3
ACA	612	0	6	1.8	-0.3	362	0	4	0	6.2	0.7
AEA	200	0	2	1.4	0.2	93	0	2	0	6.8	0.3
AEL	301	1	15	2.1	-0.1	258	0	14	0	7.2	0.4
AEW	57	2	5	1.2	-0.3	23	4	17	0	5.8	-1.1
AFL	363	0	7	2.2	0.3	194	0	6	0	8.0	0.1
AFR	790	0	5	1.4	0.2	627	0	8	0	8.1	0.1
AJM	272	1	3	1.4	-0.3	187	1	2	0	5.7	0.7
AMT	133	0	12	1.6	0.2	133	0	14	0	7.3	0.5
AMX	206	0	3	1.6	0.1	121	0	100	0	12.3	-0.3
AUA	43	0	88	6.9	6.8	36	0	17	0	8.5	1.9
AZA	342	0	6	1.8	0.1	257	0	5	0	6.9	0.8
BAF	28	0	4	1.7	-0.8	22	0	9	0	6.7	-1.4
BAL	261	0	9	1.3	-0.2	240	0	10	0	6.8	0.1
BAW	512	1	16	1.8	-0.6	354	1	16	0	6.6	0.6
BHP	28	0	0	1.1	-0.6	22	0	0	0	5.2	0.2
BPA	267	0	9	1.6	-0.2	229	0	11	0	7.7	-0.5
BWA	93	1	8	1.7	-0.4	60	0	5	0	6.2	0.4
CFC	27	0	0	1.3	-0.4	24	0	0	0	4.7	0.5
CFG	427	0	4	1.3	-0.3	317	0	5	0	7.4	0.2
CKS	188	0	9	2.1	1.0	128	0	6	0	8.2	0.1
CLX	232	0	3	1.6	-0.4	141	0	1	0	6.1	0.3
COA	110	1	35	0.8	-0.1	56	0	41	0	6.4	2.3
CRL	357	1	5	1.6	0.7	245	0	7	0	9.6	-0.1
CUB	92	2	8	1.8	-0.3	69	0	4	0	5.4	0.0
DAL	1259	0	5	1.5	-0.4	816	0	6	0	8.3	0.3
DHL	141	9	100	6.3	-6.1	71	0	100	0	22.0	4.7
DLH	631	0	12	1.4	0.0	603	0	13	0	6.7	0.8
EDW	84	0	1	1.5	-0.4	50	0	2	0	6.5	-0.2
EEZ	84	0	11	1.7	0.5	67	0	9	0	5.5	-0.4
EIA	195	2	100	3.5	1.4	187	0	100	0	21.2	5.9
ELY	178	0	1	1.3	-0.1	129	0	2	0	5.6	-0.3
FCA	74	0	0	1.2	0.0	47	0	4	0	10.0	-1.3
FDX	633	0	30	1.3	0.3	486	0	28	0	6.8	0.7
FIN	198	0	2	1.5	0.2	125	0	5	0	7.7	0.5
FWI	294	1	2	1.6	-0.4	246	2	5	0	6.7	0.5
GAF	35	0	3	1.5	-0.8	20	0	0	0	5.2	0.0
GCO	113	1	16	1.5	0.1	110	0	15	0	7.5	0.7
GRL	76	0	4	1.5	0.3	66	0	2	0	4.7	1.2
GTI	119	1	16	1.4	0.1	107	0	18	0	6.7	0.0
HXL	141	4	6	1.6	0.8	97	0	1	0	5.6	0.4
IBE	1040	1	7	1.5	0.4	709	1	9	0	6.5	0.6
ICE	1002	0	2	1.5	-0.1	584	0	2	0	6.5	0.8
KLM	950	1	3	1.5	-0.1	556	0	4	0	6.4	0.4
LAN	35	0	14	1.0	0.4	34	0	24	0	9.8	-0.9
LDI	251	0	2	1.4	0.3	157	0	6	0	8.9	0.1
LOT	172	1	5	1.9	-1.1	112	0	6	0	6.9	0.5
LTU	755	1	6	1.7	-0.2	533	0	4	0	7.3	0.7
MON	37	0	3	1.3	-0.1	29	0	3	0	8.8	-0.2
MPD	69	0	1	1.9	1.0	30	0	3	0	8.7	1.3
MPH	348	0	3	1.6	-0.8	234	0	4	0	6.7	0.1
MYT	185	0	4	1.8	0.4	132	0	6	0	8.7	0.2
NAO	44	0	7	1.7	-0.8	34	0	3	0	6.3	0.2
NCA	40	0	3	1.5	0.2	35	0	0	0	6.2	1.4
NWA	2017	0	2	1.6	0.2	1980	0	3	0	6.9	0.7
OAE	130	1	10	1.6	-0.2	84	1	100	0	17.9	5.3
PAC	205	0	6	1.6	0.2	139	0	7	0	7.8	0.8
RAM	207	0	2	1.6	0.2	79	0	75	0	7.3	0.4
RCH	183	1	100	3.8	-1.2	128	1	100	0	11.1	1.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RJA	40	0	10	2.6	-0.4	27	0	0	0	5.3	0.7
RRR	157	1	9	1.8	-0.3	157	1	12	0	8.3	0.8
RZO	91	0	3	1.4	-0.6	54	0	7	0	7.8	0.3
SEU	300	1	4	1.6	0.0	240	0	5	0	7.6	0.1
TAP	199	1	5	1.9	-0.1	83	0	2	0	6.4	0.0
TCX	35	0	11	1.7	0.8	33	0	9	0	5.5	1.5
TSC	59	0	3	1.5	-0.5	34	0	3	0	7.4	0.9
UAE	31	0	6	0.9	0.3	34	0	15	0	7.8	-1.0
UAL	301	0	52	2.0	-1.1	209	0	51	0	7.8	1.0
UPS	1063	0	51	1.5	0.0	1049	0	51	0	8.1	0.4
USA	142	0	1	1.2	-0.1	96	0	1	0	6.5	0.7
VIR	216	0	2	1.4	0.2	129	1	2	0	4.8	0.4
WOA	185	0	13	1.7	0.3	145	0	14	0	9.9	0.4
XLA	54	0	0	0.9	0.3	42	0	10	0	11.8	-0.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	32883	0	18	1.2	0.1	32883	0	17	0	4.3	0.5
TN	41	0	15	2.4	1.0	41	0	15	0	5.8	0.1

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	474	1	8	2.4	0.4	289	0	5	0	7.3	0.7
US ACARS	19786	0	32	1.4	0.2	19786	0	30	0	5.0	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	19	0	11.5	29.6	27.3
DBBH	12	Z	100	21	0	15.8	30.5	26.0
EBUQ	12	Z	100	11	0	12.6	21.4	17.3
FQFL	00	Z	100	10	0	43.5	45.4	12.9
FQFL	12	Z	100	9	0	30.1	53.9	44.7
FQFM	00	Z	100	7	0	8.8	14.6	11.6
FQFM	12	Z	100	10	0	14.3	15.2	5.1
KHRH	00	Z	100	13	0	13.4	30.3	27.2
KHRH	12	Z	100	11	0	11.7	45.9	44.4
KRPD	00	Z	100	7	0	11.4	28.3	25.9
KRPD	12	Z	100	7	0	8.7	32.9	31.7
LDWR	00	Z	100	29	0	19.0	25.7	-17.3
LDWR	12	Z	100	28	0	13.2	23.2	-19.1
OXTS2	00	Z	100	6	0	11.4	11.6	-1.7
OXTS2	12	Z	100	7	0	10.7	10.9	1.9
OXYH2	00	Z	100	5	0	9.3	10.1	-4.0
OXYH2	12	Z	100	5	1	18.8	31.8	25.6
V2XM	00	Z	100	5	0	9.2	10.3	4.6
V2XM	12	Z	100	4	0	10.0	19.7	17.0
WAAH	00	Z	100	12	0	25.2	26.4	7.8
WAAH	12	Z	100	10	0	19.4	21.1	8.2
WPKD	00	Z	100	8	0	10.3	31.7	30.0
WPKD	12	Z	100	7	0	9.2	26.9	25.3
ZCBP6	00	Z	100	9	0	12.2	41.6	39.8
ZCBP6	12	Z	100	13	0	18.0	42.2	38.2
03953	00	Z	100	28	0	13.6	17.1	10.5
03953	12	Z	100	29	0	15.4	16.5	5.8
04018	00	Z	100	29	0	14.6	14.6	-0.2
04018	12	Z	100	30	0	13.0	13.2	2.4
04220	00	Z	100	29	0	15.8	27.1	-22.0
04220	12	Z	100	30	0	14.0	24.5	-20.1
04270	00	Z	100	28	1	12.1	13.9	-6.8
04270	12	Z	100	29	0	13.0	13.7	-4.2
04339	00	Z	100	29	0	17.5	22.7	-14.4
04339	12	Z	100	28	1	20.5	20.6	2.4
04360	00	Z	100	29	0	19.7	23.4	-12.6
04360	12	Z	100	30	0	26.5	29.3	-12.5
08001	00	Z	100	24	2	44.3	45.1	8.2
08001	12	Z	100	26	0	18.6	18.8	-2.5
08508	12	Z	100	25	0	15.2	41.2	38.3
08522	12	Z	100	14	0	8.1	20.7	19.0
08594	12	Z	100	22	0	42.8	45.9	16.6
71600	00	Z	100	29	0	14.4	15.8	6.4
71600	12	Z	100	30	0	16.3	19.9	11.3
72201	00	Z	100	29	0	46.1	61.5	40.7
72201	12	Z	100	29	0	8.2	40.1	39.2
72402	00	Z	100	29	0	15.3	26.4	21.6
72402	12	Z	100	26	0	16.0	27.6	22.5
74494	00	Z	100	26	0	13.7	19.4	13.8
74494	12	Z	100	24	0	15.6	16.2	4.5
78016	00	Z	100	28	1	11.8	29.7	27.3
78016	12	Z	100	29	1	21.3	48.0	43.0

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	19	0	6.5	10.6	8.4
DBBH	12	Z	500	23	0	13.2	18.5	13.0
EBUQ	12	Z	500	13	0	8.0	9.0	4.1
FQFL	00	Z	500	11	1	7.2	7.4	-1.9
FQFL	12	Z	500	9	1	12.7	13.5	4.8
FQFM	00	Z	500	8	0	8.2	12.7	-9.8
FQFM	12	Z	500	11	0	12.7	15.2	-8.3
KHRH	00	Z	500	14	0	10.8	14.2	9.1
KHRH	12	Z	500	11	0	9.2	18.4	15.9
KRPD	00	Z	500	8	0	12.6	13.7	5.4
KRPD	12	Z	500	7	0	6.0	7.6	4.7
LDWR	00	Z	500	29	0	8.3	8.4	-1.3
LDWR	12	Z	500	29	0	10.5	11.3	-4.0
OXTS2	00	Z	500	6	0	13.3	13.7	3.2
OXTS2	12	Z	500	7	0	8.9	11.1	6.7
OXYH2	00	Z	500	5	0	7.3	7.7	-2.2
OXYH2	12	Z	500	6	1	6.3	7.6	4.3
V2XM	00	Z	500	5	0	8.4	9.4	4.4
V2XM	12	Z	500	5	0	6.6	10.8	8.6
WAAH	00	Z	500	12	0	23.6	25.6	-9.9
WAAH	12	Z	500	10	1	23.6	25.9	-10.7
WPKD	00	Z	500	10	0	9.8	11.7	-6.4
WPKD	12	Z	500	8	0	9.0	9.4	-2.6
ZCBP6	00	Z	500	10	0	5.3	25.3	24.7
ZCBP6	12	Z	500	14	0	11.8	29.0	26.4
03953	00	Z	500	29	0	9.7	9.7	0.6
03953	12	Z	500	29	0	8.3	9.0	3.6
04018	00	Z	500	29	0	10.1	10.7	3.6
04018	12	Z	500	30	0	8.3	8.3	1.1
04220	00	Z	500	29	0	11.3	11.4	-1.4
04220	12	Z	500	30	0	7.1	7.1	0.2
04270	00	Z	500	28	1	9.0	11.2	6.7
04270	12	Z	500	30	0	6.0	9.1	6.8
04339	00	Z	500	29	0	11.0	11.9	4.4
04339	12	Z	500	29	1	8.3	10.6	6.6
04360	00	Z	500	29	0	10.6	10.9	-2.8
04360	12	Z	500	30	0	11.9	11.9	0.4
08001	00	Z	500	27	2	12.0	12.3	-2.5
08001	12	Z	500	28	0	10.1	10.5	-3.0
08508	12	Z	500	25	0	8.2	8.4	1.8
08522	12	Z	500	15	0	6.6	7.1	2.6
08594	12	Z	500	23	0	7.2	7.4	-2.0
71600	00	Z	500	29	0	9.6	9.8	-2.0
71600	12	Z	500	30	0	10.7	10.8	-0.9
72201	00	Z	500	29	0	9.3	9.3	0.9
72201	12	Z	500	29	0	4.3	4.9	-2.3
72402	00	Z	500	29	0	7.1	7.2	1.2
72402	12	Z	500	28	0	8.8	9.4	-3.3
74494	00	Z	500	27	0	4.7	6.0	-3.8
74494	12	Z	500	30	0	6.4	9.3	-6.8
78016	00	Z	500	28	1	8.5	10.9	6.9
78016	12	Z	500	29	1	11.3	17.0	12.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	19	0	0	3.4	0.3	-0.5
DBBH	12	V	100	21	0	0	4.0	0.0	0.1
EBUQ	12	V	100	2	0	0	6.1	-2.9	-3.6
FQFL	00	V	100	10	0	20	3.6	0.8	-0.2
FQFL	12	V	100	9	0	33	2.3	0.6	0.4
FQFM	00	V	100	7	0	0	3.9	0.5	-0.7
FQFM	12	V	100	10	0	0	4.5	0.5	2.1
KHRH	00	V	100	13	0	100	10.7	1.9	0.1
KHRH	12	V	100	10	0	100	8.4	0.4	1.9
KRPD	00	V	100	6	0	0	5.5	3.3	0.8
KRPD	12	V	100	4	0	0	7.1	1.4	0.7
LDWR	00	V	100	29	0	0	2.9	0.1	0.7
LDWR	12	V	100	28	0	0	2.8	0.3	-0.7
OXTS2	00	V	100	6	0	16	6.9	1.9	-0.9
OXTS2	12	V	100	5	0	0	4.9	1.0	2.5
OXYH2	00	V	100	3	0	0	5.5	-2.2	2.9
OXYH2	12	V	100	2	0	0	2.0	-1.8	0.3
V2XM	00	V	100	5	0	0	2.9	0.5	0.1
V2XM	12	V	100	4	0	0	2.4	0.8	-0.4
WAAH	00	V	100	11	0	100	10.8	-1.8	-0.3
WAAH	12	V	100	9	0	100	8.3	0.9	-0.2
WPKD	00	V	100	8	0	0	7.2	1.2	0.7
WPKD	12	V	100	5	0	20	6.7	3.2	-1.1
ZCBP6	00	V	100	9	0	0	4.0	0.9	0.4
ZCBP6	12	V	100	7	0	0	4.5	-1.7	0.2
03953	00	V	100	27	0	0	3.2	-0.1	0.4
03953	12	V	100	28	0	0	3.1	0.8	-0.3
04018	00	V	100	29	0	0	2.9	0.3	0.0
04018	12	V	100	30	0	0	2.8	0.6	-1.0
04220	00	V	100	29	0	0	3.1	-0.5	-0.1
04220	12	V	100	30	0	0	3.0	0.5	1.5
04270	00	V	100	28	0	0	3.7	0.6	-0.2
04270	12	V	100	29	0	0	3.8	0.2	-1.0
04339	00	V	100	26	0	0	5.1	1.3	-0.5
04339	12	V	100	26	0	3	6.1	0.4	-0.4
04360	00	V	100	29	0	0	2.8	-0.3	0.0
04360	12	V	100	27	0	0	3.3	0.6	-0.3
08001	00	V	100	26	0	0	4.5	1.6	0.7
08001	12	V	100	22	0	0	3.6	0.5	0.2
08508	12	V	100	13	0	0	4.0	-0.2	-1.6
08522	12	V	100	13	0	0	3.7	0.4	0.1
08594	12	V	100	21	0	100	5.9	-3.2	2.2
71600	00	V	100	28	0	0	4.3	0.0	-0.5
71600	12	V	100	30	0	0	3.4	0.1	0.6
72201	00	V	100	29	0	3	6.2	2.0	1.2
72201	12	V	100	29	0	0	6.6	3.6	0.5
72402	00	V	100	29	0	0	4.2	-0.8	-0.5
72402	12	V	100	27	0	0	4.6	1.0	-0.2
74494	00	V	100	26	0	100	3.2	-0.5	0.1
74494	12	V	100	23	0	100	3.4	-0.3	0.4
78016	00	V	100	27	0	0	6.0	0.5	0.7
78016	12	V	100	29	0	0	4.5	1.2	-0.5

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Apr 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	18	0	0	2.9	-0.2	-0.2
DBBH	12	V	500	21	0	0	4.4	-0.7	-1.0
EBUQ	12	V	500	3	0	33	8.8	-3.7	-6.6
FQFL	00	V	500	12	0	25	7.6	0.2	1.6
FQFL	12	V	500	10	0	30	7.8	-1.9	-1.5
FQFM	00	V	500	8	0	0	3.1	-1.0	0.1
FQFM	12	V	500	11	0	0	5.5	0.0	-0.5
KHRH	00	V	500	10	0	100	9.7	1.4	1.1
KHRH	12	V	500	8	0	100	7.7	1.3	0.1
KRPD	00	V	500	6	0	0	4.4	1.8	1.0
KRPD	12	V	500	3	0	0	5.6	-1.3	-2.5
LDWR	00	V	500	29	0	0	4.5	0.7	0.8
LDWR	12	V	500	29	0	0	3.2	-0.9	-0.1
OXTS2	00	V	500	5	0	0	5.3	-0.5	-1.8
OXTS2	12	V	500	4	0	0	4.2	-1.2	1.6
OXYH2	00	V	500	3	0	0	4.1	1.0	2.2
OXYH2	12	V	500	4	0	0	5.6	0.5	-1.0
V2XM	00	V	500	5	0	0	3.7	1.7	-1.4
V2XM	12	V	500	5	0	0	5.4	1.2	-0.5
WAAH	00	V	500	10	0	100	8.2	-1.8	0.3
WAAH	12	V	500	9	0	100	9.0	4.2	1.1
WPKD	00	V	500	8	0	0	7.3	2.7	0.4
WPKD	12	V	500	6	0	0	7.6	1.9	1.0
ZCBP6	00	V	500	10	0	0	3.9	-0.1	2.0
ZCBP6	12	V	500	11	0	0	4.8	-1.2	0.5
03953	00	V	500	28	0	0	4.0	-1.6	-0.5
03953	12	V	500	28	0	0	4.1	0.1	1.1
04018	00	V	500	29	0	0	3.9	0.7	0.9
04018	12	V	500	30	0	0	5.1	0.3	-1.3
04220	00	V	500	29	0	0	3.4	-0.6	-0.1
04220	12	V	500	30	0	0	2.8	0.2	0.1
04270	00	V	500	29	0	0	4.8	0.3	-0.2
04270	12	V	500	30	0	0	4.2	-0.1	0.1
04339	00	V	500	23	0	0	5.5	0.8	0.4
04339	12	V	500	30	0	3	5.1	0.3	-0.7
04360	00	V	500	29	0	0	4.2	-0.3	0.8
04360	12	V	500	30	0	0	3.6	0.9	0.1
08001	00	V	500	28	0	0	4.0	0.2	0.0
08001	12	V	500	27	0	0	4.9	0.1	-0.7
08508	12	V	500	13	0	0	3.1	-0.6	-0.2
08522	12	V	500	15	0	0	3.6	0.8	-0.4
08594	12	V	500	23	0	100	4.1	-1.7	1.2
71600	00	V	500	29	0	0	5.0	1.2	0.9
71600	12	V	500	29	0	0	4.9	0.2	1.4
72201	00	V	500	29	0	0	2.9	-0.3	-0.4
72201	12	V	500	29	0	0	3.6	0.4	-1.0
72402	00	V	500	29	0	0	3.9	0.3	0.1
72402	12	V	500	29	0	0	3.1	-0.1	0.1
74494	00	V	500	27	0	100	2.9	-0.6	0.0
74494	12	V	500	30	0	100	4.9	-0.9	0.1
78016	00	V	500	29	0	0	4.5	-0.7	0.1
78016	12	V	500	30	0	0	3.8	0.3	0.0

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45